FOOD ENGINEERING

A McGRAW-HILL PUBLICATION • FORMERLY FOOD INDUSTRIES

January 1954

35 CENTS

CANNING INSERT WITH SHOW GUIDE

ELECTRONIC sterilization comes nearer to practical reality with new findings on meat. Here is test setup. (P. 52)

In This Issue:

Incentive Pays Off . . . 27
'Stone Ground' Bread 31
Speeds Beer Bottles . 33
Sanitation Checklist . 34
Quick-Dries Liquids . . 36
New Beverage Units . . 38
$-Tab on Milk Flow . . 40
Pie Output 'Unknotted' 41
Quality Italian Foods . . 42
Making Fish Sticks . . 44
Melon-Rind Products . 45
Taste-Test Chart 49
'Fluidized' Dicing . . . 50

CANNING INSERT . . . . . .

High-Frequency Cooking . . 52
New Twist in Retorting . . 54
Better Essence Recovery . . 55
Fruit to Plant—In Water . . 58
All-Out Quality Control . . . 60
Bulk Brining Saves $ 73
Show Plan, Exhibitors 74
Top-Notch Tomato Plant . . 77

Use the Free
READER SERVICE

. . . for help on your job. It brings needed data on equipment, ingredients, supplies—also useful catalogs. As you read this issue, circle page numbers on

Coupon, Page 209

Sterwin

serves the entire FOOD INDUSTRY

VITAMINS · VANILLIN

ENRICHMENT CONCENTRATES

COMPLETE FLOUR MATURING AND BLEACHING SERVICE

CERTIFIED FOOD COLORS

VITAMIN FEED FORMULAS

SANITIZING AGENTS

Sterwin Chemicals INC.

Subsidiary of Sterling Drug Inc.
1450 BROADWAY, NEW YORK 18, N. Y.

Pioneers in Food Enrichment

NEW!
FOR MARGARINE
VITAMIN A and COLOR COMBINED
BATCH PACKED!

●There is a Sterwin Technically-Trained Representative in your area. Let him show you how to put Sterwin products, service and research to work in your plant. Or write direct to: Sterwin Chemicals Inc., 1450 Broadway, N. Y. 18, N. Y.

BRANCH OFFICES:
Atlanta, Boston, Buffalo, Dallas, Evanston (Ill.), Kansas City (Mo.), Los Angeles, Minneapolis, Portland (Ore.), St. Louis

Food Engineering

Vol. 26 • JANUARY, 1954 • No. 1

PUBLISHER *Edwin D. Fowle*
EDITOR .. *Frank K. Lawler*
SENIOR ASSOCIATE EDITOR
A. V. Gemmill
SENIOR ASSOCIATE EDITOR
C. R. Havighorst
San Francisco
MANAGING EDITOR
Herb Powell
ASSOCIATE EDITOR
John V. Ziemba
ASSOCIATE EDITOR
E. W. McCarthy
ASSOCIATE EDITOR
Lloyd E. Slater
Chicago
ASSOCIATE EDITOR
Ivan C. Miller
ART EDITOR
Edward P. McGrath
CONSULTING EDITORS
S. D. Kirkpatrick
WASHINGTON
G. B. Bryant, Jr.
WORLD NEWS
J. K. VanDenburg, Jr.
ECONOMICS DEPARTMENT
Dexter M. Keezer
SALES MANAGER
G. E. Riddell

• • •

FOOD ENGINEERING
(Formerly Food Industries)
January 1954 Vol. 26, No. 1

Member ABC and ABP

Published Monthly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. **Publication Office 99-129 N. Broadway, Albany 1, N. Y.**

Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York, 36, N. Y. Donald C. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President & Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Div.; Ralph B. Smith, Vice-President and Editorial Director; Nelson Bond, Vice-President & Director of Advertising; J. E. Blackburn, Jr., Vice-President & Director of Circulation.

Subscriptions: Address correspondence to Food Engineering—Subscription Service, 99-139 N. Broadway, Albany 1, N. Y. or 330 W. 42nd St., New York 36, N. Y. Allow one month for change of address.

Subscriptions are solicited only from the executives, engineers, and technologists in food processing plants. Position and company connection must be indicated on subscription orders.

Single copies 35¢. Subscription rates—U. S. and possessions $2 for 1 yr., $3 for 2 yr., $4 for 3 yr. Canada, $3 for 1 yr., $4 for 2 yr., $5 for 3 yr. Other Western Hemisphere countries $10 for 1 yr., $16 for 2 yr., $20 for 3 yr. All other countries, $15 for 1 yr., $25 for 2 yr., $30 for 3 yr. Entered as 2nd class matter Aug. 26, 1948, at Post Office at Albany, N. Y. under Act of Mar. 3, 1879. Printed in U.S.A. Copyright 1954 by McGraw-Hill Publishing Co., Inc.—All Rights Reserved.

FEATURE ARTICLES

When Individual Incentive Replaces Group Bonus.....
"Stone-Ground" Livens Market.....
World's Largest Bottle Cleaner.....
What's Your Plant's Sanitation Quotient?.....
Speed-Dries Heat Sensitive Liquids.....
Bottlers See New Units at Chicago.....
Tabbing the Flow Spots Profits.....
Production Knots—Unraveled .....
Teams Techniques to Nail Down Quality.....
Fish Sticks—Their Acceptance Mounts.....
They've Smoothed Rough Path to Melon-Rind Items...
Refrigerating Power From Truck Engine.....
Accept the Batch?—Or Reject It? Chart Tells.....
"Fluidized" Dicer Saves Chips.....

CANNING SPECIAL With Show Guide

High Frequency Looms as Improved Cooking Method
New Twist in High-Short Retorting.....
Full Flavor Concentrates by New Technique.....
From Orchard to Cannery—Under Water.....
At Gerber's, Quality Control Reigns Supreme.....
Bulk Brining Spells Big Benefits.....
Floor Plan and Exhibitors at Show.....
Top-Notch Tomato Operation.....
Dual Tomato Cannery—How It "Ticks" (Flowsheet)

NEW EQUIPMENT & SUPPLIES

Continuous Centrifugals Up Output, Simplify Work.... 161
New Aluminum Jacketing for Insulated Lines..... 161
Twin-Action Device Codes Cases on Two Sides..... 162
Corrugated Box Has Grease-Resistant Coating..... 162
New Model Tachograph Is Easier to Read..... 163
Tilting Stabilizes Load On Rider-Type Truck..... 163
New Iron-Gate Valve for Mild Corrosives..... 165
Fast Dumping Sweeper for Heavy Cleaning..... 165
Roller Conveyor for Heavy Loads..... 167
Unit Opens, Gathers, Packs, Seals Cases..... 167
Sanitary Features Mark New Kettle..... 167
Hydrostatic Precipitator Removes Dust From Air..... 169
Device Speeds Tapping of Power From Busway..... 169
V-Type Unit Offers Sloped Handling..... 169
Unit Construction Marks New Magnetic Starters..... 171
Electronic Device Sterilizes Water..... 173
Truck Refrigeration for 24-Hr. Service..... 173
Filters Beer at 1,000 Bbl. Per Hr. Rate..... 173
Individual Degreaser Speeds Cleaning Jobs..... 175
Milk Receiving Scale Adjustable Two Ways..... 175
Rotary, Vacuum Filter for Fast Dewatering..... 177
New Product Provides Butter Flavoring..... 177

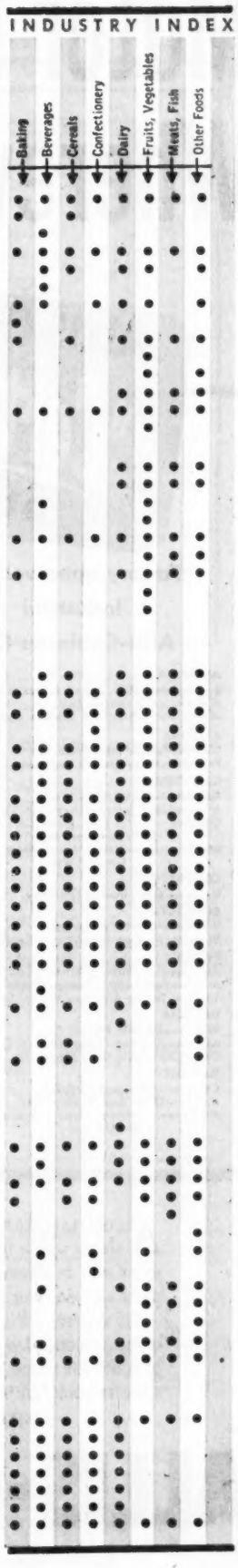
PRACTICAL IDEAS

Way to Cut Ice Cream Clean-Up Costs..... 5
Valve Lever Starts Pump Motor..... 5
Dairy Parts Wash-Up System..... 5
Nomograph for Wood Tank Design..... 7
Efficient Hopper Level Control..... 7
Bandsaw Made Safe With Microswitch..... 7
Water Fog Reduces Sugar Handling..... 9
Chart Tells Sucrose Vapor Pressure..... 9
Tire Protects Fudge Pans..... 11
Conveyor Lubricant Waste Prevented..... 11
Puts Out Hot-Fat Fires..... 11
Full Conveyor Load Assured..... 11
Conveyor Lubrication Assured..... 13
5 GF Shortcuts..... 13

OTHER DEPARTMENTS

In Behalf of Progress... 178
New Packages & Products 184
Advances in Technology. 193
Reader Service 209
Questions & Answers... 206
Useful New Books..... 220
Keeping Up With Field. 223
Hors d' Oeuvres..... 225
Schedule of Events..... 227
Recent Inventions 232
Men & Companies..... 237
Just Off the Press..... 239
Advertiser's Index 248

INDUSTRY INDEX



Motor Repair Service Wherever You Are

"Certified" SERVICE

Factory approved motor service in every industrial area from 101 Allis-Chalmers Certified Service Shops.

ALABAMA
Birmingham—Elec. Repair & Serv. Co.
Greenville—Mowbray Eng. Co.
Montgomery—Standard Electric Co.

ARIZONA
Bisbee—Copper Electric Co. Inc.
Phoenix—Daley Electric Company

CALIFORNIA
San Diego—Calif. Elec. Works
Los Angeles—Larsen-Hogue Elec. Co.
Oakland—Pacific Elec. Motor Co.
T. L. Rosenberg Co.
San Francisco—Weidenthal-Gosliner Electric Works

COLORADO
Denver—Baker Electric Company

CONNECTICUT
Hartford—Charles H. Leppert
Waterbury—Elec. Motor Repair Co., Inc.

FLORIDA
Jacksonville—Turner Electric Works
Miami—Peninsular Armature Works
Tampa—Tampa Armature Works, Inc.

GEORGIA
Albany—Georgia Electric Co.
Atlanta—Bearden-Thompson Elec. Co.
Columbus—Smith-Gray Electric Co.

ILLINOIS
Chicago—Chicago Electric Co.
Marion—Giles Arm. & Elec. Wks., Inc.
Mt. Vernon—Dowzer Electric Machinery Works, Inc.

INDIANA
Indianapolis—Scherer Electric Co., Inc.
Evansville—Evansville Elec. & Mfg. Co.

IOWA
Sioux City—Smith Elec. & Supply Co.

KANSAS
Salina—Cent. Kans. Elec. Mach. Co.
Wichita—Tarrant Electric Mach. Co.

LOUISIANA
New Orleans—Industrial Elec., Inc.
Shreveport—Shreveport Armature & Electric Works

MAINE
Brewer—Stanley J. Leen Co.

MARYLAND
Baltimore—Keystone Electric Co., Inc.

MASSACHUSETTS
Lawrence—Roland B. Glines Co.
Springfield—Elec. Motor Repair Co.

MICHIGAN
Detroit—Stecker Electric Company
Grand Rapids—Grand Rapids Industrial Electric Co.
Saginaw—Banning Elect. Prod. Corp.

MINNESOTA
Duluth—Mielke Electric Works, Inc.
Minneapolis—Parsons Elec. Co.

MISSISSIPPI
Vicksburg—Ludke Electric Co., Inc.

MISSOURI
Kansas City—Boese-Hilburn Elec. Co.
St. Louis—French-Garleman Elec. Co.
Springfield—Springfield Elec. Serv. Co.

NEBRASKA
Omaha—Omaha Electrical Works

NEW HAMPSHIRE
Concord—A. S. Tracy

NEW JERSEY
Atlantic City—Charles A. Buckley
Paterson—Elec. Service Repair Co.
Trenton—Lockwood Elec. Motor Serv.

NEW MEXICO
Albuquerque—Electric Motor Company
Powell Electric Co.

NEW YORK
Buffalo—Robertson Electric Co.
Volland Elec. Equip. Co., Inc.
Flushing—Flushing Elec. Corp.
Jamestown—A. E. Westburgh
Mt. Vernon—H. A. Schreck, Inc.
New York—Consol. Elec. Motor Co.
Rochester—Vanderlinde Elec. Corp.
Utica—Mather, Evans & Diehl Co.
Watertown—Watertown Elec., Inc.

NORTH CAROLINA
Charlotte—Southern Elec. Service Co.
Greensboro—Southern Elec. Serv. Co.
Rocky Mount—Hammond Elec. Co.

OHIO
Cincinnati—Cincinnati Elec. Equip. Electric Service Co.
Akron—A-C Supply Co.
Toledo—Romanoff Elec. Motor Serv.
Youngstown—Winkle Electric Co.

OKLAHOMA
Miami—Miami Armature Works
Oklahoma City—Southwest Elec. Co.
Tulsa—Smith-Milligan Electric Co.

OREGON
Eugene—Kalen Electric & Mach. Co.
Portland—Milwaukee Mach. Co.

PENNSYLVANIA
Johnstown—Universal Elec. Mfg. Co.
Osceola Mills—Mid-State Elec. Eng. Co.
Philadelphia—Elec. App. & Repair Co.
Pittsburgh—Penn. Elec. Coil Corp.
York—Industrial Electric Company

SOUTH CAROLINA
Greenville—Southern Elec. Serv. Co.
Spartanburg—Southern Elec. Serv. Co.

SOUTH DAKOTA
Sioux Falls—Electric Motor Repair

TENNESSEE
Columbia—Middle Tenn. Arm. Wks.
LaFollette—Standard Arm. Works, Inc.
Memphis—Indus. Elec. & Supply Co.

TEXAS
Amarillo—G. E. Jones Elec. Co.
Beaumont—Elec. Mach. & Repair Co.
Dallas—Industrial Elec. Equipment Co.
El Paso—B & M Machinery Co.
Fort Worth—Central Electric Co.
Houston—Roy A. Berentz Co.
Sweetwater—Sweetwater Electric Co.

UTAH
Salt Lake City—Diamond Electric Motor Repair

VIRGINIA
Richmond—Wingfield & Hundley
Roanoke—Virginia Armature Co.

WASHINGTON
Spokane—Lee F. Austin Company

WEST VIRGINIA
Charleston—Charleston Elec. Supply
Fairmont—West Virginia Armature Co. of Fairmont, Inc.
Morgantown—Galis Elec. Repair Co.

WISCONSIN
Baraboo—Utility Trans. & Equip. Co.
Green Bay—Beemster Electric Co.
Milwaukee—Dietz Electric Co.
Wausau—Electric Motor Service
Wisconsin Rapids—Staub's Elec. Wks.

ALLIS-CHALMERS CERTIFIED SERVICE SHOPS are independent service shops which have met rigid standards for ability, experience, equipment and business integrity. They use factory approved methods and parts and do your work promptly at a fair price.

Of course, Allis-Chalmers Certified Service Shops give good service on any electrical equipment, of any make. Tear out this ad and save it, or write the name of the A-C Certified Service Shop nearest you in your address book. Allis-Chalmers, Milwaukee 1, Wisconsin. A-4197

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

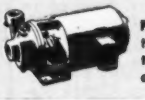
ALLIS-CHALMERS

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Distributors, Certified Service Shops and Sales Offices throughout the country.

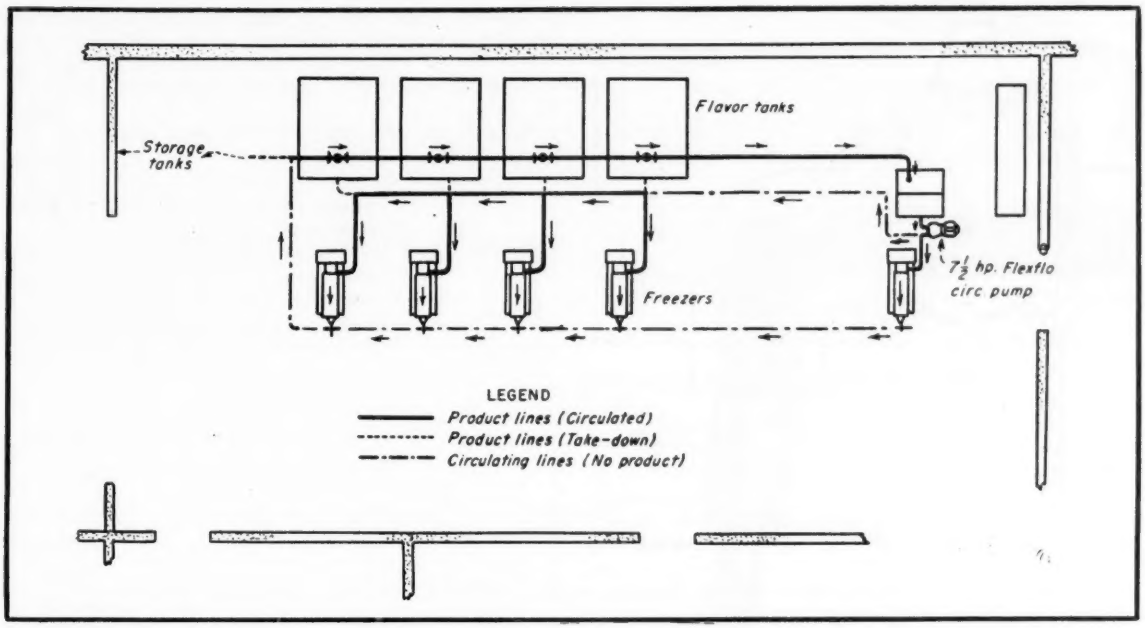
CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

***TEXROPE* — Belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.**



PUMPS — Integral types from ¾ in. to 72 in. discharge and up.

PRACTICAL IDEAS



Way to Cut Ice Cream Clean-Up Costs

Sanitary pipeline clean-up costs have been reduced at Old Hundred, Inc., Southberg, Conn. through recirculation.

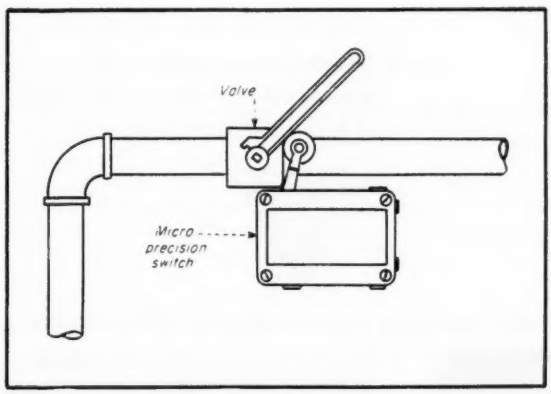
This method, it has been proved, is notably satisfactory from the bacterial count standpoint, control of the latter being better than when the conventional method of taking everything apart was employed. Of course, cost of labor for take down and reassembly, as well as for clean up, is thus avoided.

Clean-up procedure is as follows: After removing the mixed pump rotors, air control valve and pressure gages from the freezers, lines are then flushed out with cold water. Rotors, gages and plug valves are washed by hand.

Next alkali and chlorine solution at 170 deg. F is circulated for 15 min. Note that the circulating pump feeds cleaning solutions through two lines (see sketch). Solution passes through the freezers and then unites at the front.

Combined solution as shown then enters mixer line that feeds the flavor tanks. Outlet lines leading from the flavor tanks to the freezers are taken down during the clean-up period.

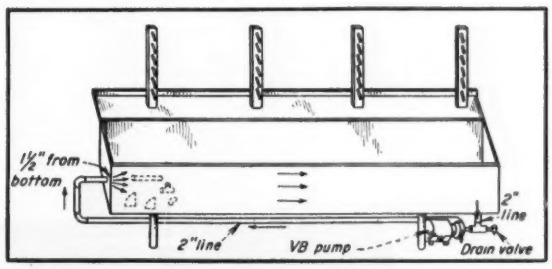
Twice during the washup, mutators in the freezer cylinders are run for a period of 30 sec. After the cleaning and sanitizing solutions have been used, the lines are flushed with water at 180 deg. F., while mutators are run for another 30 sec. period.—*Cherry-Burrell Circle, Cherry-Burrell Corp., Chicago.*



Valve Lever Starts Pump Motor

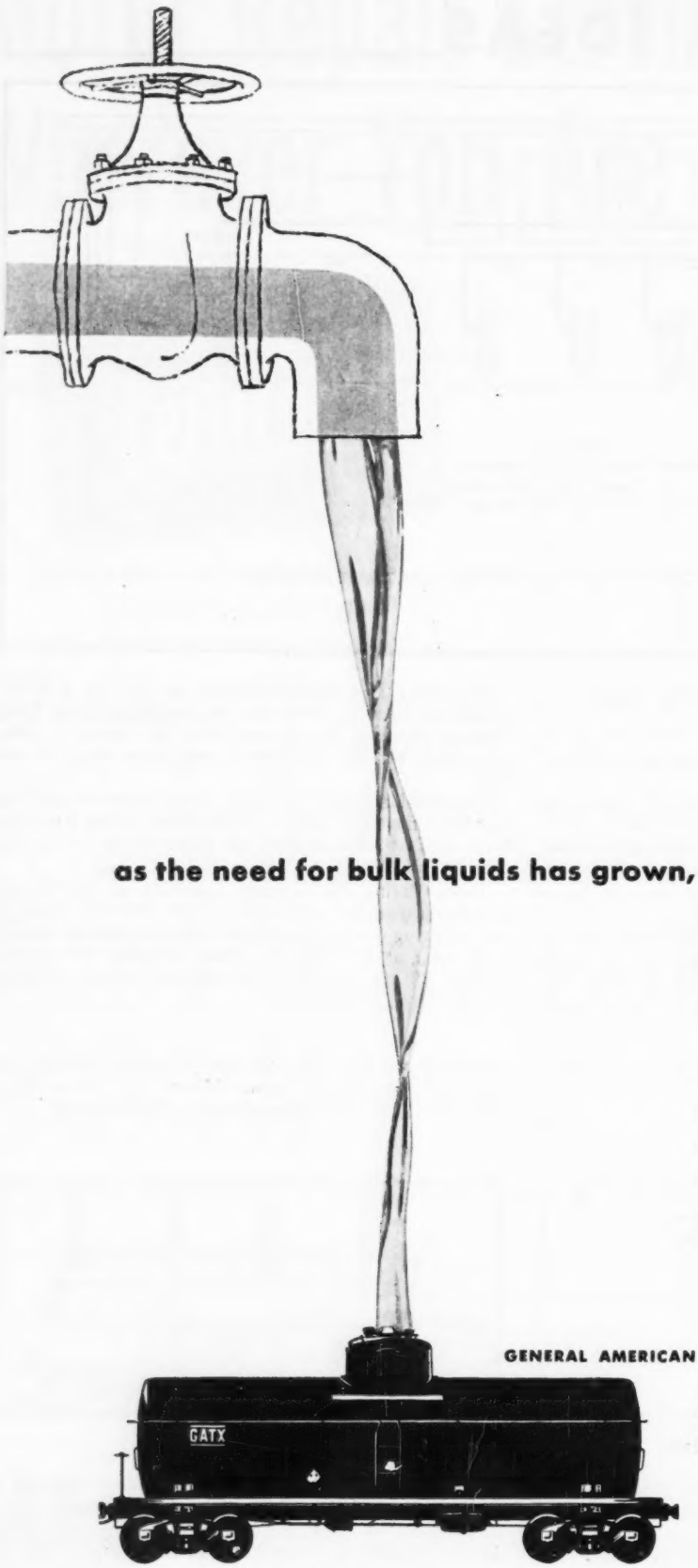
By actuating with a single arm type valve handle, a microswitch (see sketch), it is possible to control the motor of a remote pump.

Two advantages are gained. Time is saved traveling between pump and valve, and also pump can only operate when valve on line is open.—*Micro Tips, Micro Div., Minneapolis-Honeywell Regulator Co., Freeport, Ill.*



Dairy Parts Wash-Up System

With this improved method, circulation cleaning is applied to small parts, fittings and tubing which are usually cleaned by hand brushing. Equipment (see sketch), consists of a stainless steel sanitary pipe and fit-



as the need for bulk liquids has grown, new GATX tank cars have been designed, built and operated by General American

The GATX fleet of 46,000 tank cars contains more than 200 specialized types to meet the needs of bulk liquids shippers.

GATX GENERAL AMERICAN TRADE MARK

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 S. La Salle Street, Chicago 90, Illinois
Offices in all principal cities

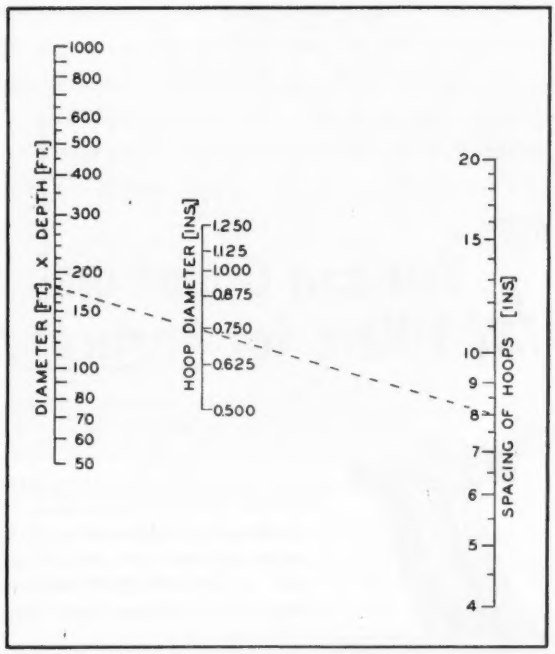
For more information, use coupon on page 209.

ting wash tank and a 3 H.P. centrifugal pump fitted for hose connections. Suction side of pump is made as short as possible.

Fittings and separator discs are placed at inlet end of the wash tank in order to receive the full effect of the cleaning solution. Tubing, which is more easily cleaned, is placed along the rest of the tank. Cleaning solutions are then recirculated through the wash tank.

Typical of cleaning procedure is the following 6-point outline:

1. Recirculate warm (110°F) rinse water for 10 minutes and then drain.
2. Recirculate acid cleaner solution (4 lb. to 90 gal. of water, heated to 140°F) for 30 minutes and drain.
3. Recirculate warm water until clear, then drain.
4. Recirculate alkali solution (4 lb. to 90 gal. of water, heated to 160°F) for 30 minutes, then drain.
5. Rinse with warm water until clear.
6. Chlorinate before tubing and parts are put back into use.—*Cherry-Burrell Circle, Cherry-Burrell Corp., Chicago.*



Nomograph For Wood Tank Design

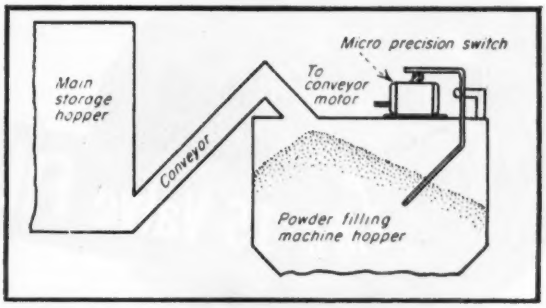
The attached nomograph facilitates the calculations associated with the proper spacing of hoops in cylindrical wood-stave tank design.

To determine the proper spacing at the bottom of a tank 12 feet deep and 15 feet in diameter, with rods, 0.75 inches in diameter, place a straight edge to connecting 180 on the left scale (see sketch) with 0.750 on the middle scale.

Line then intersects right scale at 8. Hoops therefore should be spaced at a maximum of 8 inches apart at the bottom of the tank.

This procedure is repeated for every 2 or 3 feet of depth. In each determination the product of depth by diameter of tank is determined and the spacing calculated as above. Depth is measured from the top of the stave at the top of the tank to the point at which spacing is desired.

It will be noted that the middle scale is marked with the nominal diameter of rods, ranging from ¼ to 1.25 inches in diameter. The nomograph calculates the root diameter of the thread, assuming American Standard root diameters.—*Joseph T. Hogan, Professional Engineer, New Orleans.*

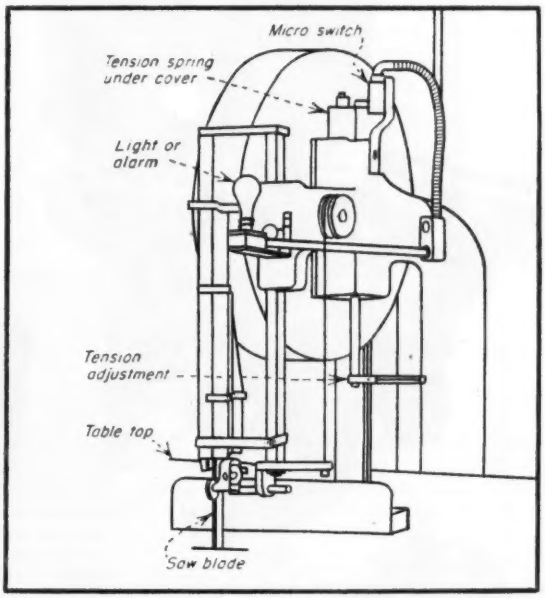


Efficient Hopper Level Control

The rate of feed of dry powdery materials to a filling machine feed hopper can readily be governed through the use of an easily installed lever arm and snap-action switch, as illustrated.

Latter controls the motor on conveyor that brings the powdery material from the main storage bin to the filling machine hopper.

Pressure of the material in the filler hopper pressing against a pivoted actuating vane (see sketch) operates the switch, thereby opening the circuit to the conveyor motor supplying material to the filler when the level in the hopper reaches a predetermined level.—*Micro Div., Minneapolis-Honeywell Regulator Co., Freeport, Ill.*



Bandsaw Made Safe With Microswitch

Accidents in meat-packing plants resulting from broken bandsaw blades operated with improper tension, can be avoided through the use of a micro-precision switch, as illustrated above.

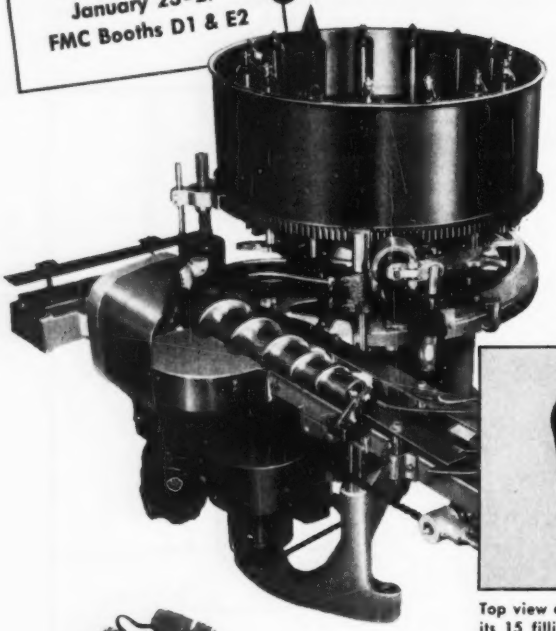
Tension of the bandsaw blade is regulated by a "hand

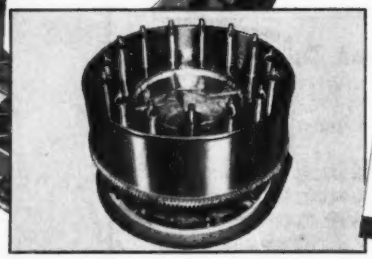
THE FIRST REALLY NEW FILLING PRINCIPLE IN 20 YEARS!

fmc 15 Valve FIL-MOR Liquid Filler

The amazing FMC FIL-MOR liquid filler introduces a brand new concept of filler design and construction, and features an unmatched standard of accuracy. Its 15 filling valves uniformly pre-measure the liquid before releasing it into the cans, while a constant supply of liquid is maintained at a pre-set level in the liquid supply tank. A highly uniform fill is possible even at speeds up to 325 cpm, depending on can size and product. Here at last is a machine of utmost simplicity, ideal for fast, economical filling of all types of clear liquids, and fruit and vegetable juices.

See this remarkable new filler at the CANNERS SHOW January 23-27 FMC Booths D1 & E2





Top view of the FIL-MOR filling bowl, showing its 15 filling valves and the inner tank which controls the liquid level in outer bowl.

You can Count on *fmc* Fillers for Accuracy

FMC is proud to announce this outstanding new development to the industry. We believe this equipment will find a ready place among progressive processors and canners everywhere. For complete information, write today for your copy of the new 15 Valve FIL-MOR Bulletin No. 301E, or call your nearest FMC representative.

FOOD MACHINERY AND CHEMICAL CORPORATION

Canning Machinery Division

General Sales Offices:

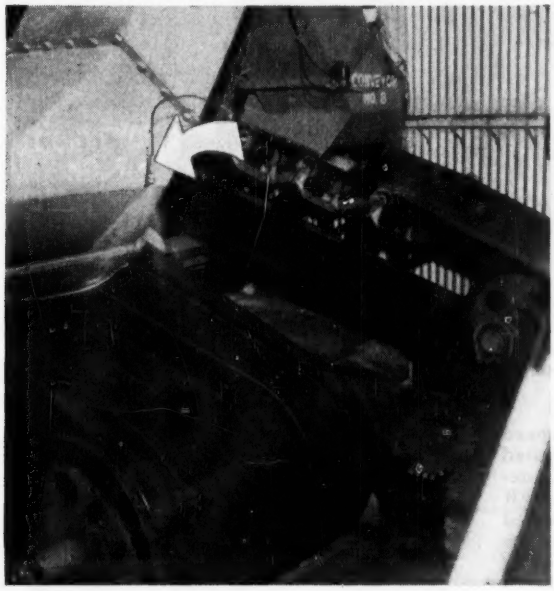
WESTERN: SAN JOSE, CALIFORNIA **EASTERN:** HOOPESTON, ILLINOIS

screw" on the sliding sleeve which is located at either the upper or lower bandsaw wheel. Position of this sleeve indicates tension on the blade.

To warn of excess tension, microswitch is connected so that when the sleeve travels beyond a given point, the switch is actuated to turn on a warning light or sound an alarm.

Thus, it is indicated to the operator that the blade tension is incorrect and that the machine should be shut off and adjusted immediately.

An additional safety measure can easily be included by installing a relay in the circuit to stop the saw when the blade tension exceeds safe limits.—*Micro Div., Minneapolis-Honeywell Regulator Co., Freeport, Ill.*



Water Fog Reduces Sugar Handling

Finely atomized water sprayed on conveyor belts (see photo) has eliminated the re-handling of tons of raw sugar at our bulk loading plant. Sticky material adhered to the carrying surfaces of the ten conveyor belts which load sugar aboard ships at the rate of 700 tons an hour. During loading operations it was necessary to brush off many tons of sugar, which then had to be handled in a subsequent separate operation.

Water spraying belts were adopted after it was noticed that sugar has less tendency to stick when there is moisture in the air. Now less than 100 lb. adheres to the belts following 8-10 hr. of operation.—*Henry Rente, Maintenance Supt., Kauai Consolidated Terminals, Ltd., Nawiliwili, Kauai, Hawaiian Islands.*

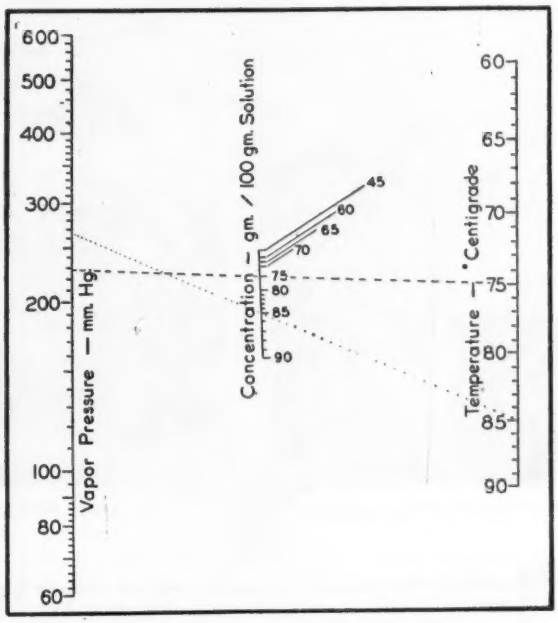


Chart Tells Sucrose Vapor Pressure

Vapor pressure of a sucrose solution may readily be determined through the aid of the accompanying nomograph.

As an example, should it be desired to determine boiling point of a solution of 75% by weight sucrose (75 grams sucrose per 100 grams of solution) under a pressure of 228 mm. of mercury, place a straight edge connecting 228 on the vapor pressure scale with 75 on the concentration scale. This will intersect temperature scale at 75. Therefore, 75 deg C. is the boiling point of the solution. —*Joseph T. Hogan, Professional Chemical Engineer, New Orleans, La.*

$50 Extra for Best Item

You are invited to submit Practical Ideas. You will be paid at regular rates when your item is printed and if it is judged best for the month you will get an additional payment of $50.

Selection of the best contributed item will be made by a group of 200 readers each month, and the item title and author's name will be cited (see under arrow, right).

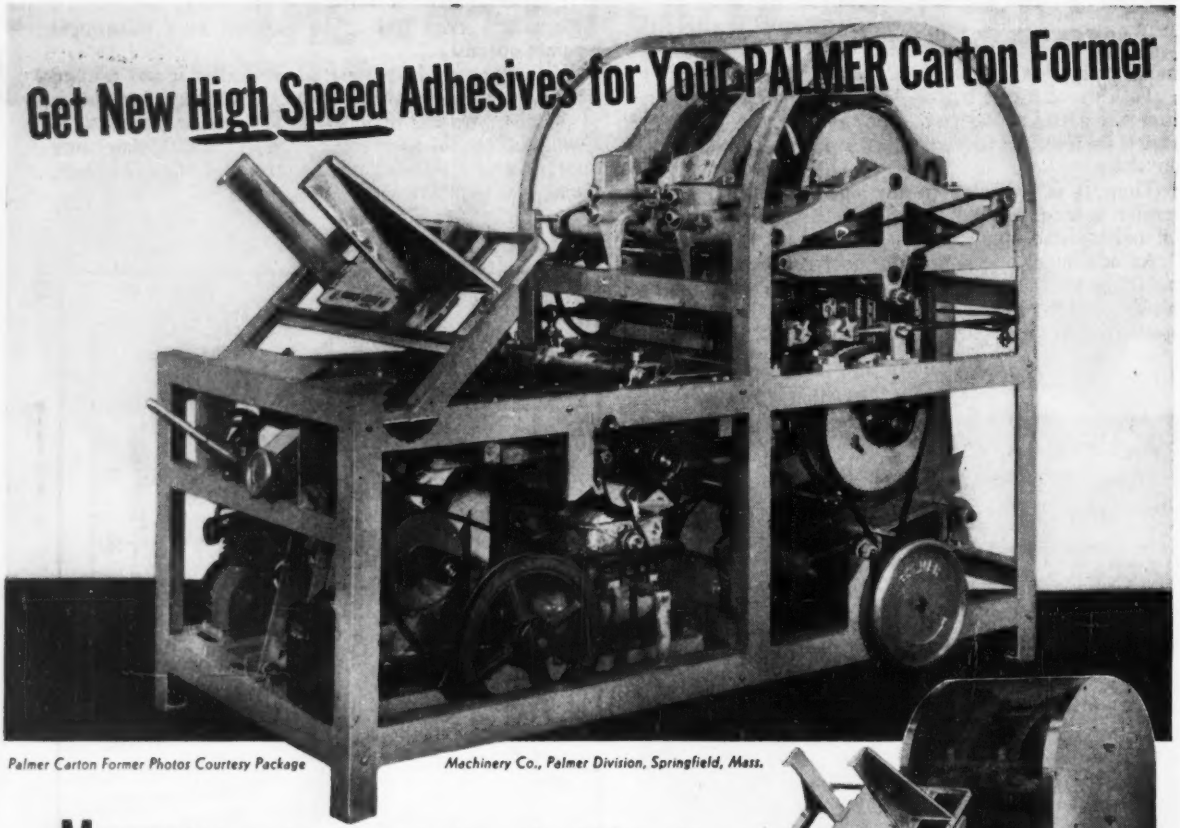
Practical Ideas may describe any type of device or method recently developed to solve a problem, speed an operation, or make some task easier. They may concern factory, laboratory, warehouse, or power-plant operations in the food industry. Ideas on management, maintenance, and trucking or shipping also are suitable.

You need not be an experienced writer or draftsman to submit these ideas. The text will be edited and sketches converted to finished drawings.

Send your items to: Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.

NOVEMBER PRACTICAL IDEA winner was "Prevents Can Injury in Accumulator", which was submitted by Robert W. Williams, Sr., Hunt Foods, Inc., Bridgeton, N. J. Applied is a home-made electromagnet which grasps a can in feed line to stop flow of empty containers whenever double-decking occurs. Magnet is energized when microswitch is closed by a trip bar that lifts when cans are forced into two layers.

Get New High Speed Adhesives for Your PALMER Carton Former



Palmer Carton Former Photos Courtesy Package Machinery Co., Palmer Division, Springfield, Mass.

MODERN high speed packaging requires modern high speed *ADHESIVES!* Paisley Scientific Research has anticipated industry's needs. Remarkable new Adhesives have been developed for Super-Speed operations. Whether it's a PALMER (102 per minute) Continuous Carton Former or other high speed machines, there's a Paisley Scientific Glue developed to the highest known degree of perfection for *each specific operation!* You can expect efficient, continuous production, hour after hour, from these new and better Adhesives. They are designed for single or double end cartons and for whatever stock is being run. And they'll withstand the constant agitation of fast applying mechanisms. Tell us your package forming or labeling problems. Benefit from the newest developments in Scientific Adhesive engineering.

SEND FOR. . .

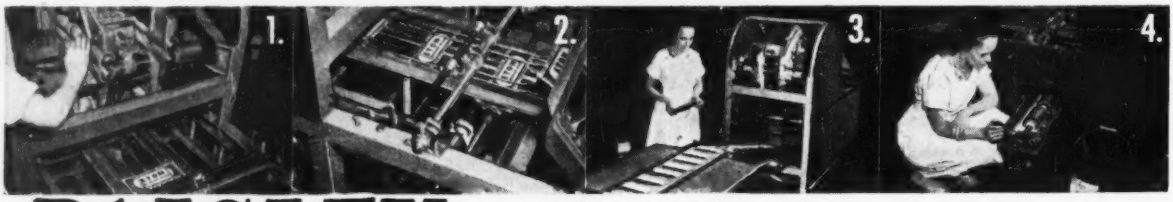
☐ **Free set of Laboratory Reports describing wide range of Paisley Adhesives for Palmer Machines.**

☐ **Free 6 page Folder and Adhesive Operation Data Sheet for consulting service on correct adhesives to fit ALL your labeling, sealing and packaging operations.**

Paisley SCIENTIFIC ADHESIVE SERVICE

1. & 2. *Continuous chain feeds glued blanks to mandrels and forming plates — glues must seal instantly on contact at speeds over 100 per minute!*

3. & 4. *Continuously revolving glue rollers require dependable, economical adhesives that won't break down under constant agitation.*

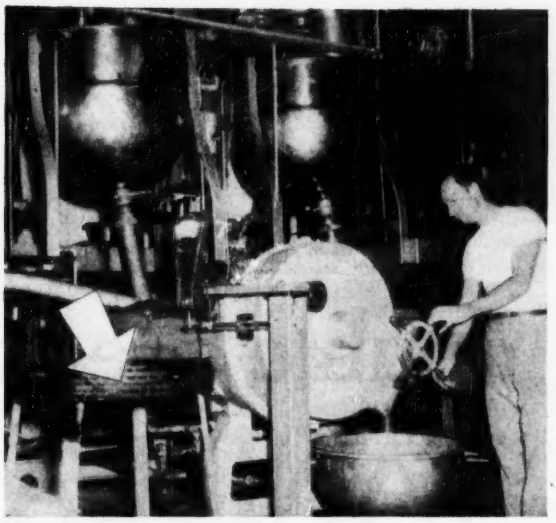


PAISLEY PRODUCTS INCORPORATED

Division of MORNINGSTAR, NICOL, INC.

1770 CANALPORT AVENUE, CHICAGO 16, ILLINOIS ★ 630 WEST 51st STREET, NEW YORK 19, NEW YORK

Manufacturers of Glues · Pastes · Rosin Adhesives · Cements and related Chemical Products

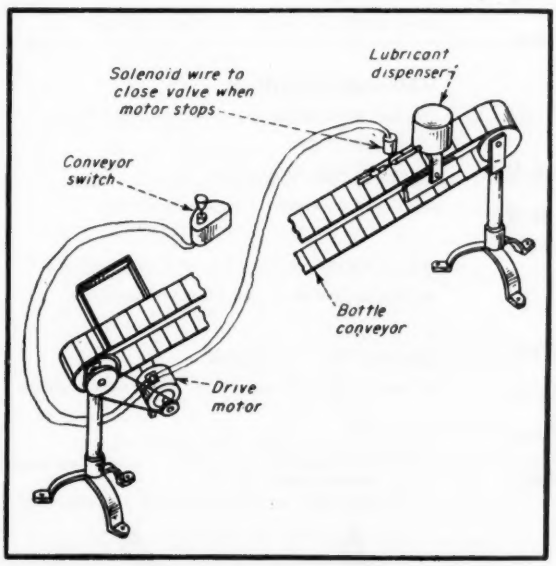


Tire Protects Fudge Pans

Attaching the casing of an automobile tire to the top of a caster-mounted stand for transporting fudge from batch mixer to cooling slabs, has simplified handling and extended the life of the transfer bowls.

All that was done was to cut the rim from a used automobile tire (see photo) and to force the casing over the top of the stand.

Practice shows tire cushion is easily kept in sanitary condition by steam-cleaning once a day. Pan-handling-labor is reduced and bowl-life extended.—*FE Staff.*

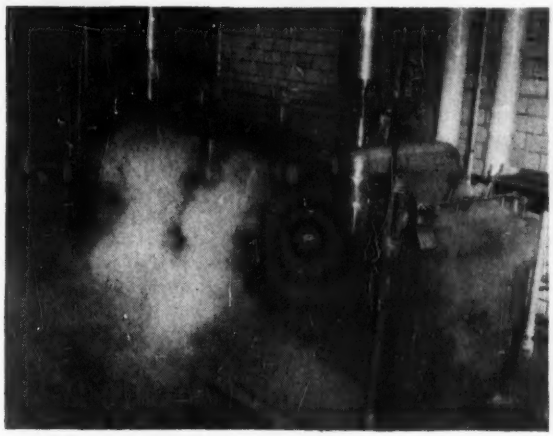


Conveyor Lubricant Waste Prevented

Dissipation of bottle conveyor lubricant when the mechanism is not operating can be prevented by a simple and inexpensive installation. Lubricant saved will soon pay for the cost of the installation.

Merely install a solenoid valve in the lubricant dispenser line and wire it to the drive motor of the conveyor in such a manner than when motor circuit is interrupted, solenoid valve closes, thus shutting off the flow of lubricant to the unit.

Selected should be a solenoid valve of the type that is normally off when no power is supplied.—*Cherry-Burrell Circle, Cherry-Burrell Corp., Chicago.*



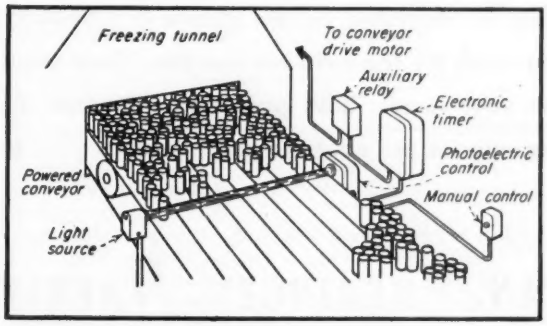
Puts Out Hot-Fat Fires

Installed at the doughnut frying station at Hough Bakeries, Inc., Cleveland, is a fire-extinguishing assembly that automatically releases a blanket of carbon dioxide over the hot fat whenever conflagration temperatures are reached in the enclosed area above the cooker.

Installed here are controls which, when actuated by combustion temperatures, trip valves on two 50-lb. cylinders of carbon dioxide, to release the gas over the fat in the cooker.

In addition, a trip and switch (built in piping network) are operated by released-gas pressure to stop fryer motor, shut off fuel supply, and also stop fan and then close the exhaust duct dampers. Though designed for automatic operation, carbon dioxide release system can be manually controlled.

Not only is this method efficient for controlling fires, but its use entails no costly after effects. Neither the food nor the machinery is damaged, and the gas is soon dissipated, requiring no clean-up of messy floors.—*Walter Kidde & Co. Public Relations, New York City.*



Full Conveyor Load Assured

If the conveyor which feeds cans of concentrated juice into a blast type freezer is not fully loaded, freezing efficiency of unit is lowered. For instead of the downblast of

Time to double check VANILLA *Quality*

Many manufacturers today are revising their vanilla flavor formulations, and this is the time to put the stress on quality — make a change for the better. The trend is back to real vanilla taste and the standard Alva vanillas have been doing just this job for years.

In selecting any vanilla, pure or imitation, double check it with the finest pure vanilla extract. Then buy the best you can afford.

With the changing vanilla picture it is important that you check the famous Alva vanillas. There are many to suit your needs, both pure and imitation. The Alva laboratories are eager to help. Send us your problem.

PURE VANILLA EXTRACT
The finest extract, processed for over two months.

PURE VANILLA 4X
Same quality as above, four times stronger.

VANILLA-VANILLIN
The best pure extract extended with vanillin.

IMITATION VANILLA 4X
Developed on a natural vanilla bean base.

IMITATION VANILLA 4X (Special)
An inexpensive grade, excellent for specialties.

IMITATION VANILLA
A clean, brilliant flavor, fine as a chocolate stretcher.

VANILLA SUGAR (Imit.)
A dry imitation bean powder.

VAN AMERINGEN-HAEBLER, Inc.
521 West 57th Street, New York 19, New York

Alva FLAVORS

refrigerated air coming in contact with cans of product, refrigerating effect is by-passed through conveyor.

This condition can readily be avoided by use of a photoelectric control and electronic timer which sound an alarm and stop conveyor if there's a gap in container load.

The photoelectric control beam (see sketch) shines horizontally across the conveyor. The timer is wired for delayed action and is started by the photoelectric control.

A pushbutton is used to start conveyor and bypass the timer relay until conveyor moves cans into the photoelectric control beam. The operator releases the pushbutton, and conveyor continues to move cans as long as the control beam is interrupted.

If a gap appears, the photoelectric control beam is established across the conveyor. Then the photoelectric relay drops out and starts the timing cycle of the electronic timer. If the gap length exceeds the preset delay interval on the electronic instrument, the timer relay drops out, shuts off conveyor and rings an alarm.

Conveyor starts, alarm stops, and the timer resets—all automatically—when gap is filled and beam re-broken.

If gap length is shorter than the timed interval, cans coming along conveyor break the beam, and the photoelectric relay closes before the timing interval ends. This resets the timer and allows uninterrupted conveyor movement.—*Photoswitch, Inc., Cambridge, Mass.*

5 GF Shortcuts

From General Foods Corp. (Technical Bulletins) come the five brief–but pertinent–Practical Ideas described in the following paragraphs.

They cover, in order, use of cemented chrome carbides to resist corrosion; doubling up on motors to relieve overloads; savings on illumination in the plant; improvement of plant roadways; and minimizing of parapet-wall troubles for greater structural life.

Recently announced cemented chrome carbides have shown outstanding resistance to corrosion and erosion. Excellent results are noted in resistant to salt spray, sulphuric and nitric acids, steam errosion, latic and citric acids and to oxidation. Carboloy Co., Detroit, Mich. is the manufacturer.

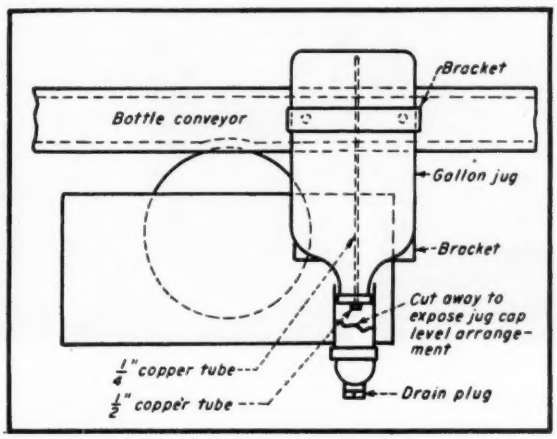
Over-loaded motors can sometimes be relieved by connecting a second motor to the same load to make up the deficiency. This is practical if motor performance characteristics are the same. It is not necessary that motors be the same size.

Illumination levels currently being recommended by authorities are usually very conservative. Experience shows that satisfactory illumination is commonly obtained at around half (or less) of old recommended values.

Dusty hard-surfaced plant roads in parking areas can be improved by spraying ¼ to ½ gal. of oil per square yard. Oil should be equal to Texas Company MC-2. Sprinkle on a light coating of clean sand or fine gravel after oil application and allow to remain two to four weeks, then sweep up the excess sand or gravel.

Here are some ways to minimize parapet wall troubles and related roof difficulties.

Use an impervious through-the-wall flashing below the coping stone. Make sure in laying up new walls that the brick layers leave no voids. Scrupulously avoid the use of impervious water-proofing treatments on either side of the wall. Use superior roof flashing construction to avoid leakage. Impervious surface treatments prevent evaporation of moisture that may get into the masonry through leakage or condensation and which will, therefore, damage the wall through ice-crystal formation in freezing weather.

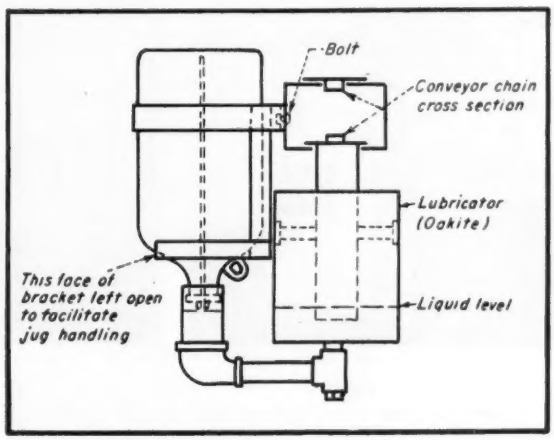


Conveyor Lubrication Assured

Faults of the lube system on our bottle conveyor were overcome by simply constructed additions.

When the system's tank was filled, too much of the soap type lubricant was lifted by the wheel and deposited on the conveyor chain. When the tank's liquid level was set for proper operation of the chain, the soap solution was too quickly exhausted.

With the use of a gallon jug, some pipe fittings, and a few inches of copper tubing, we constructed a constant-level arrangement and also a reservoir large enough to hold a day's run of solution.

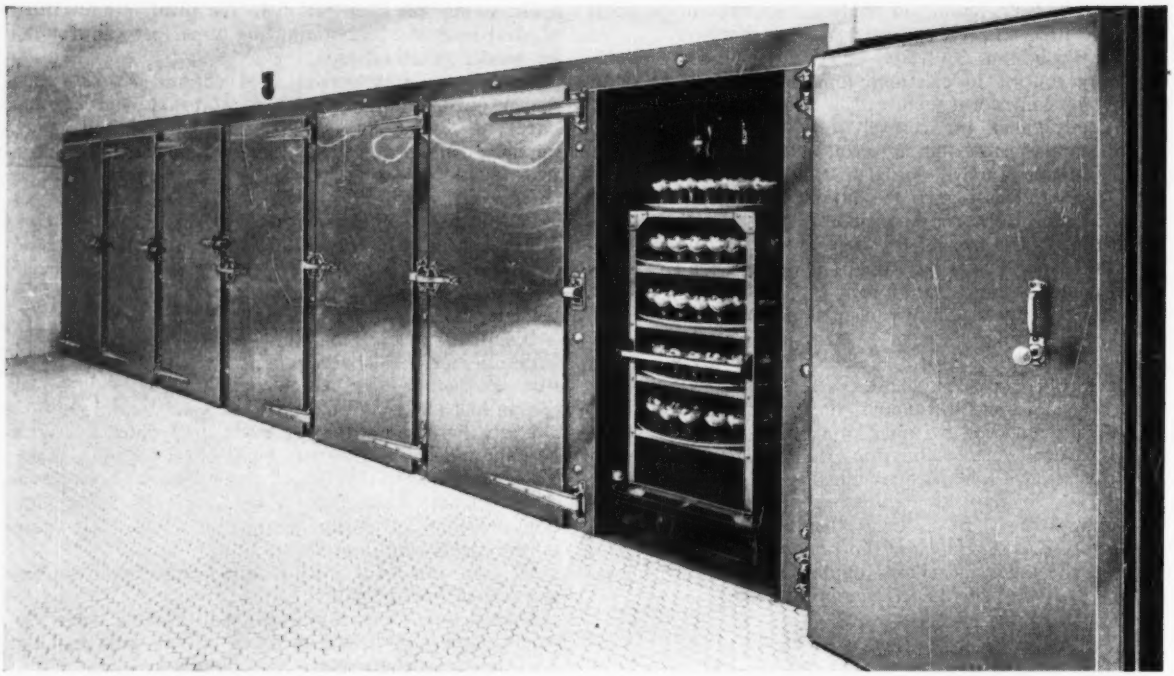


A piece of ½ in. copper tubing long enough to reach the desired level was soldered to the perimeter of a hole cut in the jug's cap.

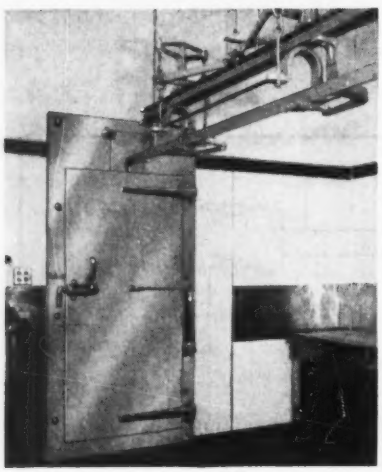
Some difficulty was experienced because of the inability of the solution to flow due to its surface tension. This was overcome by soldering a piece of ¼ in. tubing (long enough to reach within ¼ in. of the jug's bottom) to one side of the inner surface of the ½ in. tube.

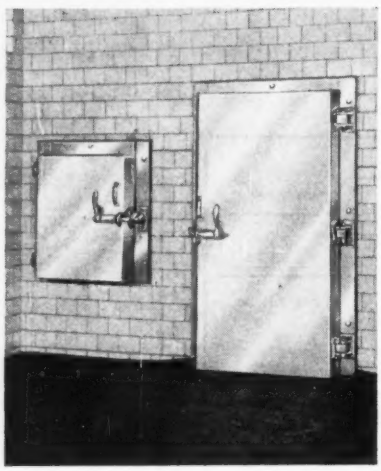
A bracket to hold the jug was made of ⅛ x 1 in. angle iron and bolted to the conveyor frame.

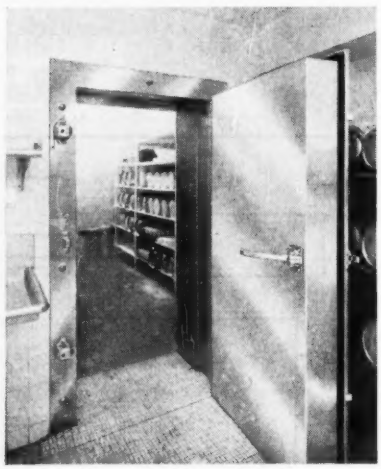
Proper lubricant level is thus maintained and drippage on the floor eliminated.—*A. J. Morgan Jr., Norfolk Coca-Cola Bottling Works, Norfolk, Va.*



Have Stainless Beauty + JAMISON Efficiency in 1 Door







Whether you need a door for coolers—frozen food storage to 0°F—or sharp-freezing operation to as low as −40°F you can have it PLUS by specifying the super-sanitary, easy to clean, beauty of stainless steel cladding in JAMISON Standard, JAMISON Lo-Temp or JAMISON Super Freezer Doors. For complete information, specifications and dimensions, write outlining your type operation to Jamison Cold Storage Door Company, Hagerstown, Maryland.

JAMISON

HAGERSTOWN, MARYLAND, U. S. A.

The leader for over 50 years

For more information, use coupon on page 209.

Satisfaction rests on the carton

Pioneers in their field, C. A. Swanson & Sons had to solve many shipping problems for themselves. Union corrugated boxes have proved a thoroughly satisfactory carrier for their products. Perhaps Union packaging specialists can help you. They are alert to new situations, responsive to new ideas, supported by the development facilities of the world's largest integrated box plant.

TRADE MARK UNION
INTEGRATED PLANNING
INTEGRATED PRODUCTION

UNION BAG & PAPER CORPORATION

CORRUGATED CONTAINER DIVISION • Box Plants: Savannah, Ga., Trenton, N. J., Chicago, Ill.

Eastern Division Sales Offices: 1400 E. State St., Trenton 9, N. J. • Southern Division Sales Offices: P.O. Box 570, Savannah, Ga.
Western Division Sales Offices: 4545 West Palmer, Chicago 39, Ill. • Executive Offices: Woolworth Bldg., New York 7, N. Y.

For more information, use coupon on page 209.

Better ANY WAY YOU LOOK AT IT...

AMERICAN

"Every Angle" DIAL THERMOMETER

The American "Every Angle" Dial Thermometer is easy to install and turn to any position for accurate face-to-face readings. Specify the "Every Angle" — indoor or outdoor design — and this unbeatable feature combination is yours:

DEPENDABLE ACCURACY. The "Every Angle" Thermometer is made of precision-machined, non-corrosive materials and operates by vapor pressure. It is precisely calibrated against certified standards to assure the most critical reading in the upper third of the dial, where the graduations are farthest apart.

CONVENIENCE. Dial face can be rotated 180° and tilted 180° for accurate reading at the most convenient angle.

WEATHER-PROOF DESIGN. *Screw-type ring* with tight-fitting gasket for weather-proof outdoor service; *slip ring* design for indoors.

REINFORCED MOUNTING. Heavy-gauge swivel hinge has a *stainless steel kingpin.* Reinforced connection between hinge and bulb. Greater strength and corrosion resistance, long service life!

EASY INSTALLATION. Socket connections have compression-type bushings. No costly jigs needed — connection easily welded to tanks or other irregular-shaped equipment.

Ask your Distributor to help you select the American "Every Angle" Dial Thermometers with the proper temperature ranges for your needs. Phone or write him today.

SPECIFICATIONS

NON-CORROSIVE DIAL CASE: Non-corrosive aluminum with smooth black finish. No protruding screw heads. Nickel-plated brass cup houses coiled capillary tubing.

DIAL: 3½" diameter. White with black figures. **POINTER:** Black, adjustable. **FRONT:** Heavy plate glass. **MOVEMENT:** Bronze or stainless steel. **BULB AND STEM:** Stainless steel. **SIZE CONNECTION:** ½", N.P.T. **STEM-LENGTHS:** 3", 5-5/16", 12", 18" and 24". **SEPARABLE SOCKETS:** Bronze, carbon steel or stainless steel.

STANDARD RANGES

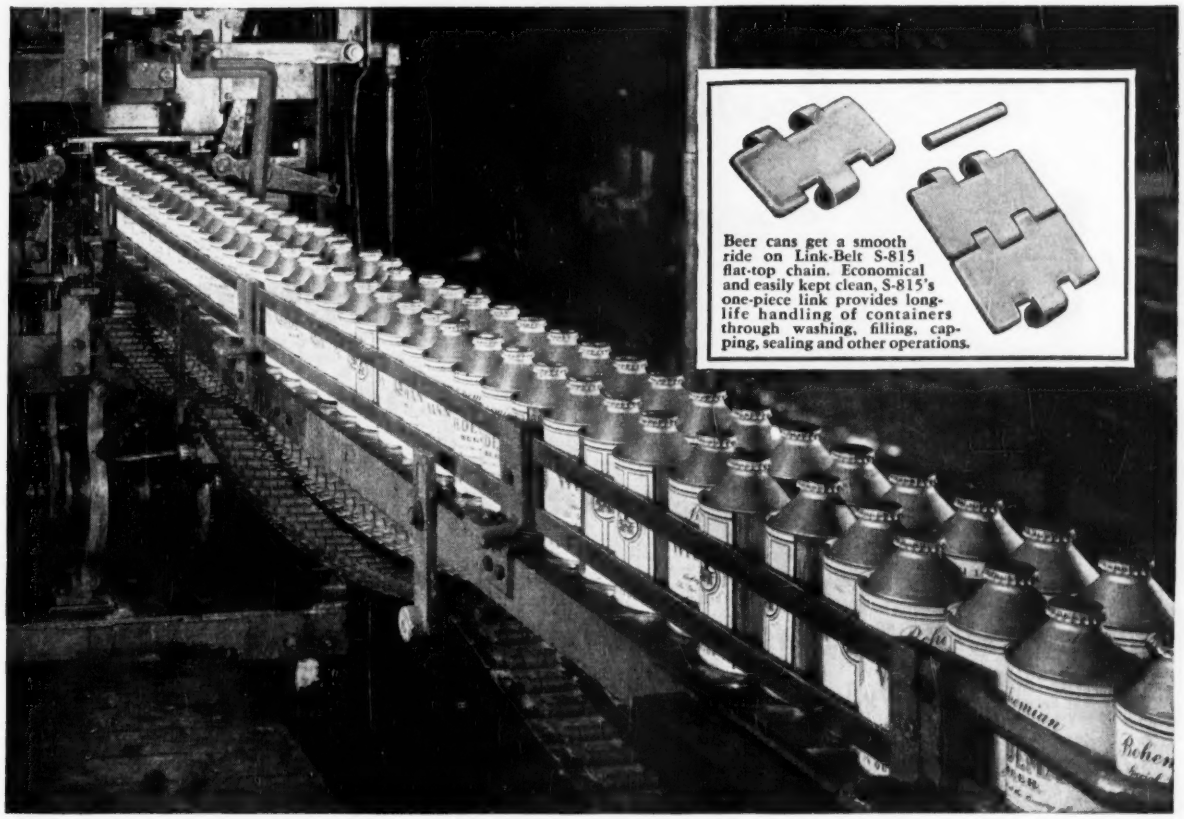
Fahrenheit	
—60 to 20°	30 to 300°
—20 to 120°	100 to 300°
40 to 140°	90 to 350°
30 to 180°	190 to 390°
20 to 220°	260 to 450°
Centigrade	
0 to 100°	40 to 150°

YOUR INDUSTRIAL DISTRIBUTOR makes it his business to see that you get the best possible equipment. That's why he handles only products of proved quality and dependability — like Manning, Maxwell & Moore products.

AMERICAN INDUSTRIAL INSTRUMENTS

A product of **MANNING, MAXWELL & MOORE, INC.** STRATFORD, CONNECTICUT

MAKERS OF 'AMERICAN' INDUSTRIAL INSTRUMENTS, 'HANCOCK' VALVES, 'ASHCROFT' GAUGES, 'CONSOLIDATED' SAFETY AND RELIEF VALVES. BUILDERS OF "SHAW-BOX" CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES.



Beer cans get a smooth ride on Link-Belt S-815 flat-top chain. Economical and easily kept clean, S-815's one-piece link provides long-life handling of containers through washing, filling, capping, sealing and other operations.

Here's a smooth-operating, flat-top conveyor chain... moderately priced

LINK-BELT offers the chain that's best for every job

THE many varied drive and conveying jobs performed by chains and sprockets require different physical characteristics. The S-815 flat-top conveyor chain is an example of how Link-Belt builds a type and size for every purpose.

In addition, every chain in the complete Link-Belt line is built for longer life. Rigid control of raw materials and manufacturing processes is your assurance of uniformity.

For all the facts on S-815 flat-top conveyor chain, ask for Folder 2344. And for information on the complete Link-Belt chain line, see your nearest Link-Belt district sales representative.

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle; Scarboro, Toronto and Elmira, Ont. (Canada); Springs (South Africa); Sydney (Australia). Sales Offices in Principal Cities.

LINK-BELT

CHAINS AND SPROCKETS

13,325

No one chain serves every purpose... get the RIGHT one from Link-Belt's complete line

Class RC crescent flat-top chain—travels in horizontal planes, around corners; ideal for bottles and cans.

Malleable roller chain for conveyors or inclined elevators where reduced chain pull is desired.

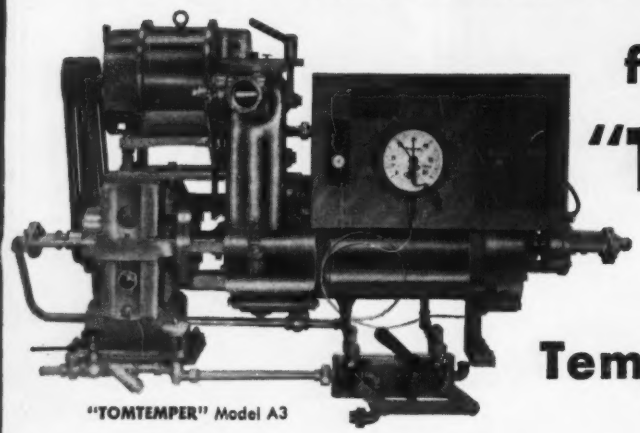
Class 400 swivel chain—carries cartons, cases, etc. over paths with both vertical and horizontal turns.

Class RC flat-top chain—precision made for smoothest, spill-free carrying and long life.

Class RC universal crescent flat-top chain can be used for multiplane operation traveling variety of paths.

For more information, use coupon on page 209.

Revolutionary...



"TOMTEMPER" Model A3

fully automatic "Tomtemper" Chocolate Tempering Machine

It Guarantees More Attractive Finish – Finer Fracture – Better Taste

JUST LOOK WHAT THE "Tomtemper" OFFERS:

FULLY AUTOMATIC OPERATION Easy to operate. Requires only one adjustment.

MINIMUM PROCESSING TIME Combines undercooling with intense mechanical mixing to achieve ideal tempering cycle at lowest possible viscosity.

FAST START UP Delivers correctly tempered chocolate less than 4 minutes after starting.

FAST CHANGEOVER Switches from one type of chocolate to another in 3 to 5 minutes.

HIGH OUTPUT Up to 3600 pounds of chocolate per hour; 5000 pounds per hour with accessory cooling.

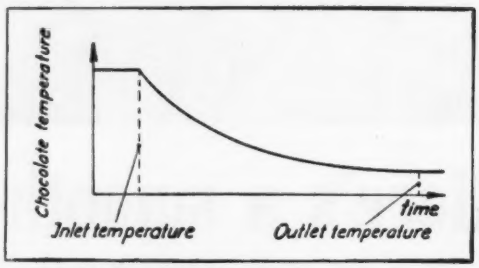
SMALL SIZE Measures approximately 47" x 22" x 20".

ABSOLUTELY HOMOGENEOUS TEMPERING Exposes every particle of chocolate to same tempering treatment.

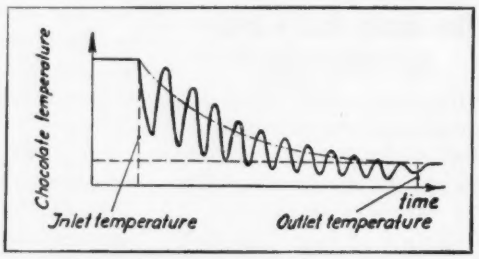
GUARANTEED ACCURACY within ± .9°F of desired temp.

And these are but a few of the many outstanding features offered by the *"Tomtemper."*

"TOMTEMPER" Thin-Film Tempering Machines are manufactured by TOM'S Laboratory LTD. which also manufactures a line of Fancy Molding Plants and Chocolate Chip Making Machines.



AVERAGE TEMPERATURE of chocolate as it progresses through the *"Tomtemper"* is shown above.



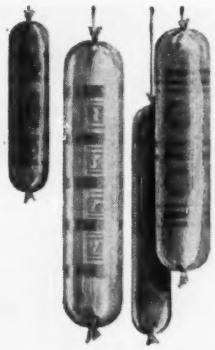
UNDERCOOLING AND MIXING Graph above shows how *"Tomtemper"* achieves the outlet temperature by undercooling and mixing.

GEVEKE & COMPANY, INC.

25 BROADWAY, NEW YORK 4, N. Y.

MANUFACTURERS' REPRESENTATIVES • SPECIALIZED MACHINERY AND EQUIPMENT • FOUNDED AMSTERDAM 1876 •

Now! Shorten Curing Time



Cut Smokehouse Costs

Now, for approximately a quarter-cent a pound of finished product, you can use Pfizer Ascorbic Acid or Sodium Ascorbate to cut costs in the preparation of cooked, cured, comminuted meats.

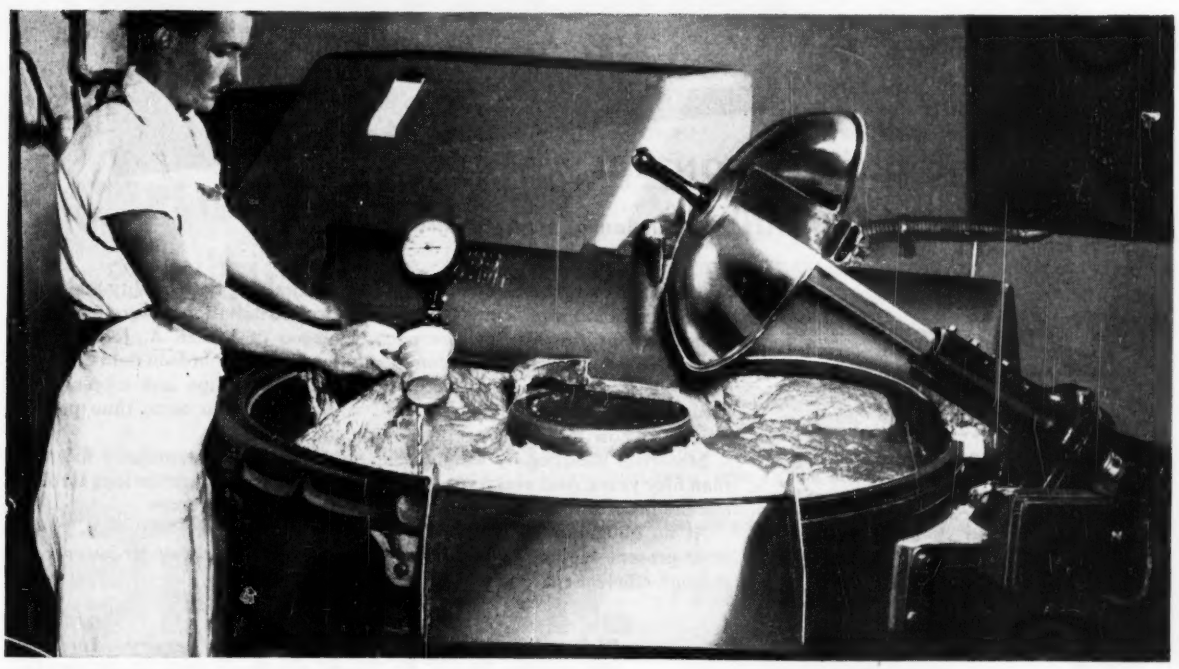
In frankfurters, bolognas and other related meat products, these processing aids reduce considerably the time required in the smokehouse. Shorter curing time means an end to production bottlenecks and less shrinkage in the finished products. You save both time and money.

In certain cases Pfizer Ascorbic Acid or Sodium Ascorbate may give your cured meats greater color retention... keep them appetizing looking for longer periods of time.

These products are easy to use. Simply dissolve in water and add near the end of the chop. Available at strategically-located warehouses in a variety of mesh sizes. For prices and technical information call...

Pfizer Ascorbic Acid and Sodium Ascorbate

CHAS. PFIZER & CO., INC.
630 Flushing Ave., Brooklyn 6, N. Y.
Branch Offices: Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.



Manufacturing Chemists for Over 100 Years

Pfizer

For more information, use coupon on page 209.

PROVIDES
SPEED
AND
AUTOMATIC QUALITY CONTROL

...for the MURRAY COMPANY (Division of H. A. Johnson Co.)

PROBLEM:

High labor charges and uncertain accuracies in loading sugar to syrup kettles presented a challenge to the cost- and quality-conscious management of the H. A. Johnson Co.

SOLUTION:

A suitable conveyor system feeding a Richardson Automatic Scale provided high volume, controlled accurate flow of sugar to the cookers. Another alert management had reduced their labor charge to practically nil and incorporated machine-made, repetitive accuracy into their process.

Rising labor costs *can* be offset while still maintaining both quality and quantity production. Proof of this is the Richardson installation pictured, recently completed for the Murray Company, Division of the H. A. Johnson Co., Boston, Mass. Adopting the recommendations of a Richardson field engineer, this well known manufacturer of soda fountain syrups and toppings has actually increased output at reduced unit cost. At the same time product quality is now rigidly controlled, *automatically*.

Materials handling by weight has been a Richardson specialty for more than fifty years. And every year has seen more practical applications throughout the processing industries of this wide range of experience.

At no obligation to you, a Richardson engineer will gladly call, survey your present methods, and show you the Richardson way to lower costs through efficient materials handling by weight.

Richardson
MATERIALS HANDLING BY WEIGHT SINCE 1902

Richardson Scale Co., Clifton, New Jersey. Automatic Weigher Systems of All Types: Automatic Bulk Weighing Hopper Scales, Including Conveyor-Feed Types • Continuous Feeder-Weighers • Automatic Bagging Scales • Bag Sewing Conveyors Packers • Multi-Material Proportioning • Process Control Panels. *Branch offices in:* Atlanta • Boston • Buffalo • Chicago • Detroit Houston • Minneapolis • New York • Omaha • Philadelphia Pittsburgh • San Francisco • Wichita • Montreal • Toronto.

For more information, use coupon on page 209.

See what you can shake out of that cost sheet...

when you decide to
SIMPLIFY and SAVE
on lubrication!

You can reduce more than one column of cost figures... save real money... when you let *a few* Pure Oil multi-purpose lubricants do the work which normally requires dozens of separate oils and greases. Pure Oil, you see, specializes in industrial lubricants, each of which is formulated to do *many different jobs equally well.*

Not only do you save on the number of lubricants, but you save on *man-hours* and *machine maintenance* too. Your whole plant lubrication system—from purchasing to inventory to application—becomes simpler, faster and surer... saves time, saves machines, *saves money!*

Clip out the handy coupon and mail it today for our free booklet on this valuable labor-saving, money-saving, lubrication program.

It Starts Here!

Be *sure* with Pure—Sales offices located in more than 500 cities in Pure's marketing area.

PURE OIL INDUSTRIAL LUBRICANTS

FREE BOOKLET

The Pure Oil Company, Industrial Sales Dept. H-41
35 E. Wacker Drive, Chicago 1, Illinois

Please send me your free booklet on how to "Simplify and Save"

NAME_____

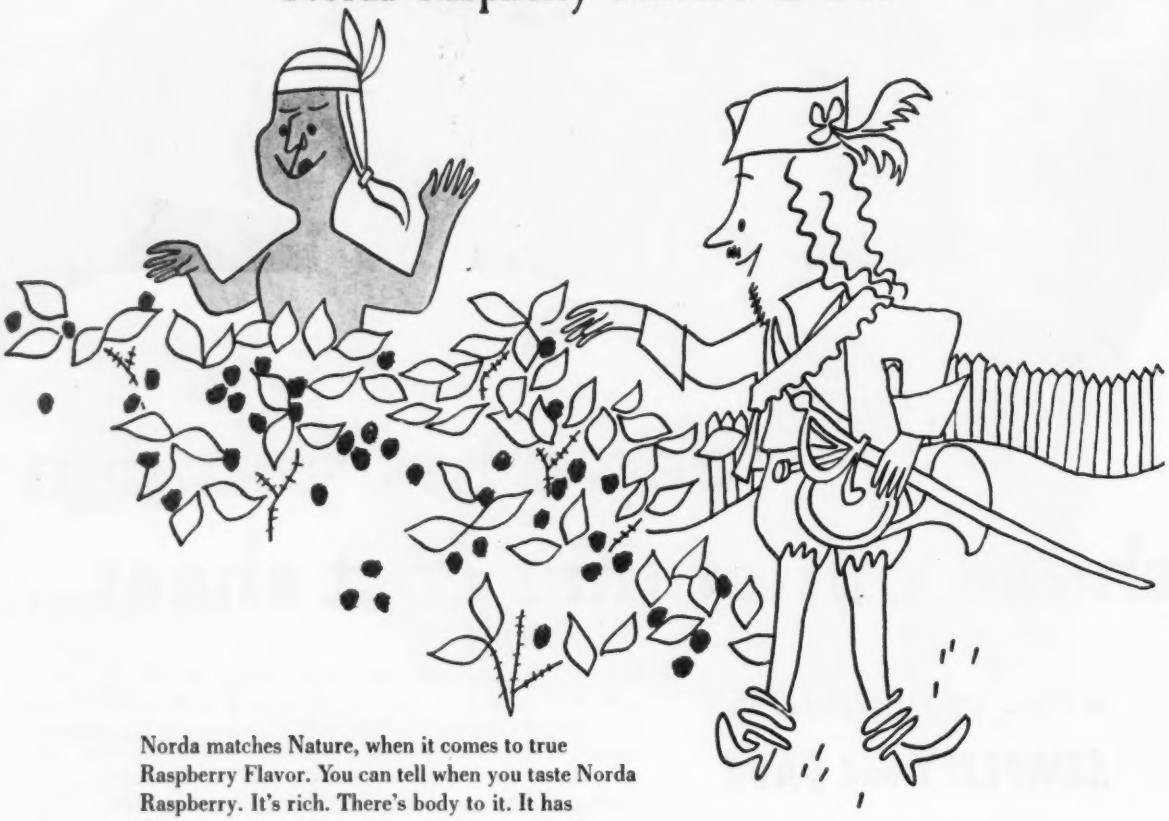
POSITION_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE____

It's said that in 1696,
The Raspberry first was found;
People seem a lot happier now:
Norda Raspberry Flavor's around



Norda matches Nature, when it comes to true Raspberry Flavor. You can tell when you taste Norda Raspberry. It's rich. There's body to it. It has the same real raspberry character that makes the fresh fruit so fine.

Norda makes both genuine natural and imitation red and black raspberry flavors. They have the characteristics of the actual fruit. Their concentrated richness is true-to-life. Their strength saves money for you.

Improve the quality, aroma, tastiness, and popularity of your ices, gelatins, fondants, syrups, and mixes by using Norda Raspberry Flavor. See how much you will improve them by testing and tasting the generous free samples we hope you will send for *today*.

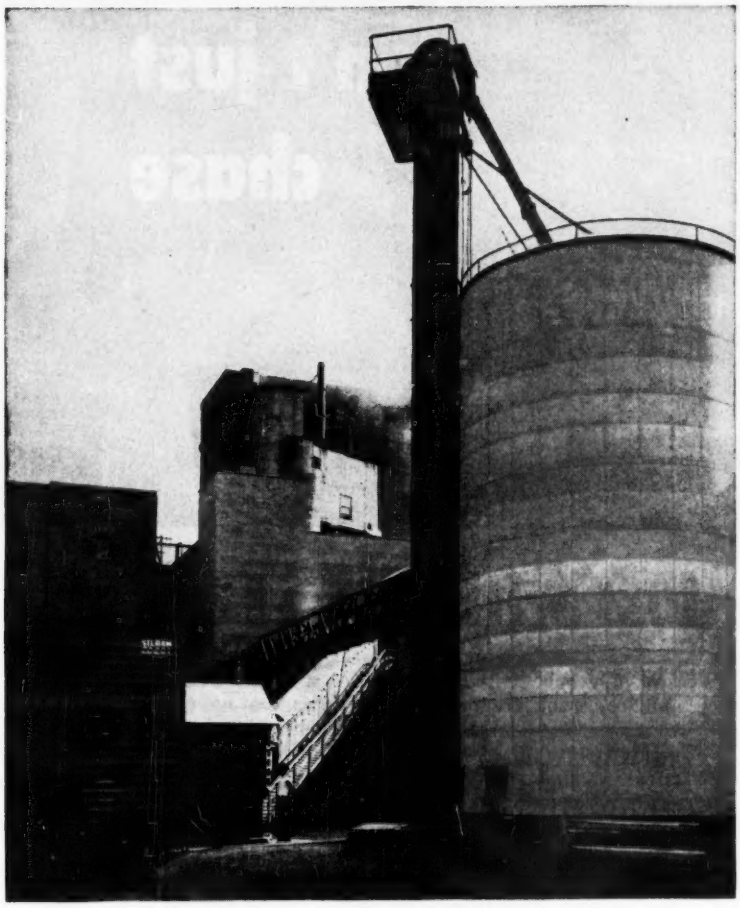
Use "A Favorite to Flavor It"... A Norda Flavor

Norda

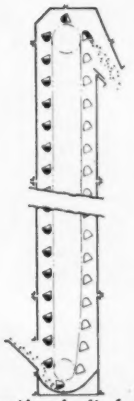
ESSENTIAL OIL AND CHEMICAL COMPANY, INC.
601 West 26th Street, New York 1, N. Y.

CHICAGO • LOS ANGELES • SAN FRANCISCO • ST. PAUL • DALLAS • MONTREAL • TORONTO • HAVANA • LONDON • PARIS • GRASSE

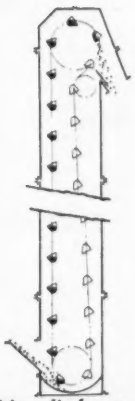
13 types...4 basic designs to meet your elevating requirements



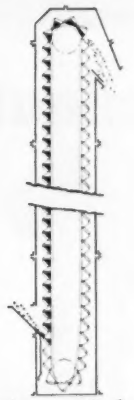
Link-Belt screw conveyor and bucket elevator handle material from railroad car to storage silo.



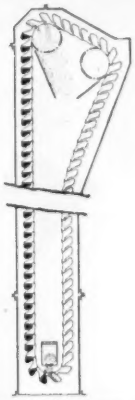
Centrifugal discharge for free-flowing, fine or loose materials with small to medium lumps.



Positive discharge for light, fluffy, fragile or any materials that tend to stick to the buckets.



Continuous discharge for many materials — light to heavy, small to large, abrasive lumps.



Internal discharge for gentle handling of small articles such as pellets, rivets, seeds, castings.

Let LINK-BELT recommend the bucket elevator best-suited to your needs

WHERE large or small quantities of bulk materials must be elevated in limited space, a bucket elevator is the equipment you need in most cases. And, in every case, you'll find the one that can do the job for less in the complete Link-Belt line.

Link-Belt builds a type and size of bucket elevator for every requirement. Included in the 4 basic designs are 13 types of bucket elevators designed to suit a variety of materials. A wide range of sizes on chain or belts is also available.

Other Link-Belt engineering extras: Rigid, jig-built casings are self-supporting requiring only occasional lateral tie-ins depending on height. Periodic inspection is speeded with easy access to both head and boot. Chain or belt tension is maintained at all times with simple screw or gravity take-ups. You can get complete engineering information from the Link-Belt office near you.

LINK-BELT

BUCKET ELEVATORS

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices in Principal Cities. 13,213-A

. . . eliminate dust with WESTONE!

Dramatic proof of ANTISEPTIC WESTONE'S effectiveness. The hand at left was rubbed across an ordinary untreated section of floor. The hand at right was rubbed over a section which had been treated with dust-controlling ANTISEPTIC WESTONE.

Sweeping only rearranges dust. As a matter of fact, sweeping and floor traffic are the main dust spreaders—not open doors and windows as you might think. And dust is damaging. It spreads many harmful disease bacteria that often cause absenteeism. It affects precision apparatus and delicate finished products. Makes store merchandise, office and institutional floors unsightly.

ANTISEPTIC WESTONE CONTROLS DUST. Loosens and picks it up from floors, bins, shelves, furniture. Seals floor surfaces. Improves their appearance. Holds down subsequent dust so traffic can't raise it. Its antiseptic properties inhibit growth of bacteria.

ANTISEPTIC WESTONE is economical. It works as fast as a man can walk. One man can do the work of three in maintaining floors. And it goes a long way. One gallon covers 4,000 square feet. Interested? Check the coupon.

WEST DISINFECTING Company

42-16 West Street, Long Island City 1, N. Y.
Visit us at Booth No. 315 at the Plant Maintenance Show in Chicago

WANT DETAILS?

Tear out this coupon and mail with your letterhead

Dept. 8

I'm interested in:

☐ A FREE leaflet on WESTONE.

☐ A talk with a West expert about my special floor problems. No sales pitch. No obligation. Just discussion and a demonstration if I want it.

For more information, use coupon on page 209.

ADVANCED FERRO-PHOBIA

. . Fer'ro-pho'bia, n. Fear of iron.
It's enough to kill any cost-conscious plant manager—fear of tramp iron damaging equipment, causing shutdowns, ruining product purity.

No couch can cure it, but a Dings Magnet can. When ferro-phobia symptoms — unhappy people moaning about lost production — show up in your plant, phone your representative or write Dings. They'll prepare an effective magnetic Rx, backed by 50 years of experience, that will end the plague in a hurry.

KEEPING BUTTER SALT PURE
Dings induced-roll high-intensity magnetic separators are used by major salt producers to keep there product free of the finest magnetic impurities.

Dings

DINGS MAGNETIC SEPARATOR COMPANY
4741 West Electric Avenue
Milwaukee 46, Wisconsin

DINGS MAGNETIC SEPARATOR COMPANY
4741 West Electric Avenue
Milwaukee 46, Wisconsin

Please send me Catalog C-1205-B on Dings Perma-Plate Magnets and Catalog C-5000-B with data on the complete Dings line.

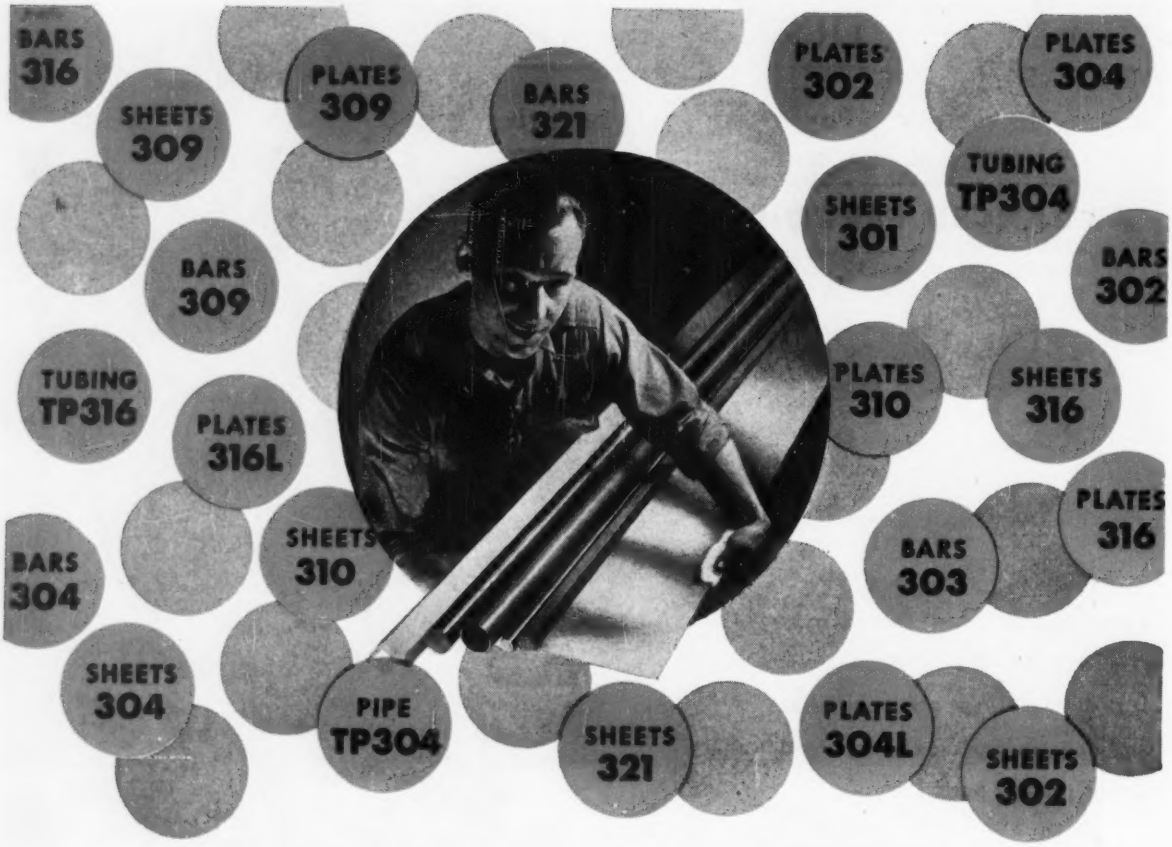
Name_____ Title_____

Firm_____

Address_____

PP453

For more information, use coupon on page 209.



Nickel-Bearing Stainless

Large stocks . . . quick shipment . . . for any use!

Once more—without any red-tape—you can get all the nickel-bearing stainless steel you want from Ryerson. And get it fast, too!

Ten different types are immediately available from stock—in sheets, plates, bars, tubing or pipe (see circles above). Many new sizes and types have been added. And it's all time-tested Allegheny stainless steel.

Of course, we also continue to carry straight chrome stainless in a wide variety of types, shapes and sizes for applications where the more expensive nickel-bearing types are not needed. So you can depend on Ryerson for *complete* stainless service—including the practical assistance of Ryerson stainless specialists in selecting the right type for the job or in solving difficult fabrication problems.

For quick delivery of anything in stainless just call your nearby Ryerson plant. And you save time—avoid inconvenience by having all your other steel requirements included in the same delivery.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled & cold finished
STRUCTURALS—Channels, angles, beams, etc.
PLATES—Many types including Inland 4-Way Safety Plate
SHEETS—Hot & cold rolled, many types & coatings
TUBING—Seamless & welded, mechanical & boiler tubes
ALLOYS—Hot rolled, cold finished, heat treated
STAINLESS—Allegheny bars, plates, sheets, tubes, etc.
REINFORCING—Bars & Accessories, spirals, wire mesh
BABBITT—Five types, also Ryertex plastic bearings
MACHINERY & TOOLS—For metal fabrication

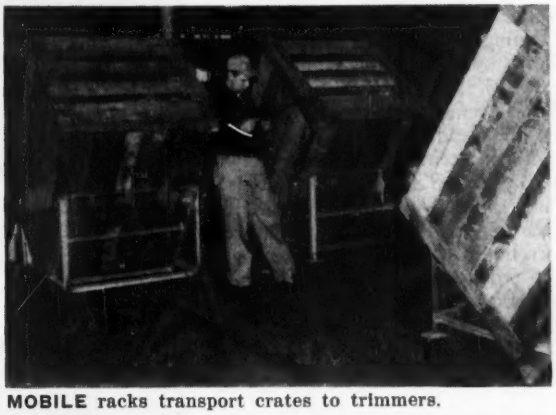
JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

RYERSON STEEL

For more information, use coupon on page 209.

Mechanical Changes Pave Way for Incentive at Trim Stations

LARGE crates replace metal tote-bins.



MOBILE racks transport crates to trimmers.

TILTING forks are added to lift trucks.

COMPANY designed knife speeds cutting.

When Individual Incentive Replaces Group Bonus—

Output Per Worker Zooms

Seabrook achieves phenomenal results with new system that clicks with workers, and with mechanical improvements introduced to make incentive plan possible

IVAN C. MILLER
Associate Editor, "Food Engineering"

Production rates on several lines, at Seabrook Farms Co., Bridgeton, N. J., have increased as much as 50%, and workers' incomes have advanced proportionately. These gains were made possible by mechanical changes which permit the replacing of group bonus by individual incentive.

Line efficiency was upped, not merely by shifting a few of the operations from one type of incentive to the other, but also by developing an incentive method that really works.

On the frozen asparagus and broccoli lines, the shift to individual incentive was made on the sorting operation and also on package filling and weighing. Major changes made on the frozen cauliflower lines were at the initial preparation station.

Let us first observe how output per manhour at the cauliflower trimming station was more than tripled.

During the time preparation was on a group-bonus basis (and also prior to the bonus incentive period), untrimmed heads of cauliflower were delivered to the plant in bulk by truck. Heads were manually transferred to mobile metal tote boxes, and these were pushed up to trimming stations to supply the operators.

Originally the operation required a crew of 18 workers with knives, who removed stems and leaves from the heads, while an additional crew of ten

men was required to service the stations. These latter workers maintained a flow of material from the receiving dock to the cutters, and also removed the trimmed heads. An intermediate handling method was tried before arriving at the present efficient procedure.

During the period of changes, records were kept to ascertain a norm on which to base incentive calculations. Average hourly trim rate then was 209 heads per worker.

When incentive was later paid on the production rate of two-man trim-teams, output was increased to 400 heads per man-hour. Now, however, since bonus is paid on individual output, production has spiraled to well over 600 heads per man-hour.

Here are the changes in method and the mechanical improvements that made this increase possible.

First, wire-screen sided, reinforced, wood crates were built to replace tote boxes mounted on wheels. In these pallet-crate containers cauliflower heads are transported and handled—all the way from the farms to the trim tables.

Gained by this shift to crate containers, which hold much larger volume than the mobile tote bins, were incidental advantages other than an accelerated trimming operation. Less loss of product and less damage to heads resulted when the crate method of handling was adopted. Also provided by the shift was a unit for measuring output—on which a payment rate for individual production could be based.

In spite of this general improvement, one disadvantage of the crate was immediately apparent. Removing the last half of the heads from the bottom of the upright containers required of workers fatiguing bending and reaching, and also slowed down the operation.

Devised next was a means for delivering the crates to the trimmers so that these workers could unload the contents with minimum effort and in the least time.

This was done by designing special metal stands, mounted on casters, into which the crates are now placed in an elevated tilted position. Crate stands permit containers to be rolled accessibly titlted and as needed to the trim stations.

Introduced thereby was the problem of handling the heavy crates, lifting and loading them in tilted positions into the special stands. This problem was solved by employing lift trucks with rotating forks. A special attachment added to a lift fork permits the crate to be rotated to the desired angle and then raised or lowered in this tilted position.

CONTAINER is added as unit measure.

PACKAGE fill and weigh is made an individual operation.

Last of the innovations that made possible a shift of incentive plan was an improvement in the trimming tool itself.

Employed during elimination tests were cabbage corers and straight-bladed knives. Both proved hazardous and wasteful. Furthermore, workers' speed (without waste of heads) was limited when either of these methods was employed. Then Seabrook engineers designed a cutter especially for the purpose—one that overcomes the disadvantages of the former tools.

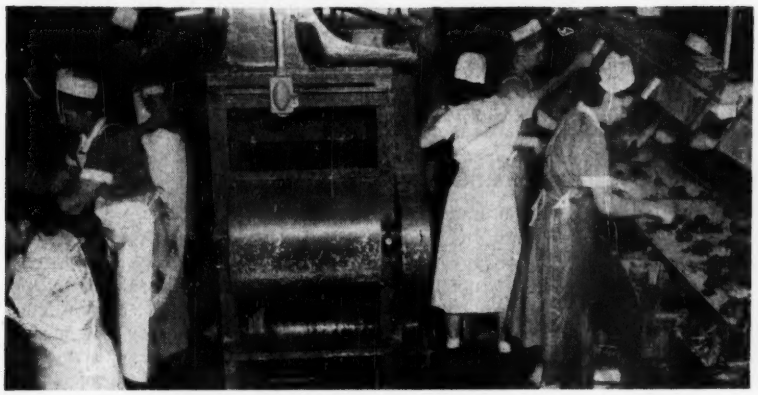
Forged from bar stock, this trimming instrument has a spoon-shaped end, edges of which are ground to knife sharpness. These cutters are employed chisel-like, with a thrust motion, to sever heads from stems and leaves (latter usually recessed) without damage to the heads. When any stems remain, they can be removed readily by a slight chop with the cutting side of the spoon and without damage to the heads.

Present, home-made tools have proved fast, thorough, and safe.

Now, only six men are required for trimming and only six men for servicing the cutting stations. Trimmers, whose incomes have been boosted considerably, are paid bonuses determined by the production of the individual. The group bonus of those servicing the stations is determined by the average production of all the trimmers above the norm. As a result of the mechanical changes and a shift to a combination individual-group incentive, 12 workers now accomplish as much as the 28 formerly required. These 12 find no difficulty keeping lines running at full capacity.

Now let's observe changes in the asparagus-broccoli lines—and the results obtained when line adjustments made possible bonus payment for individual accomplishment.

Line Possible When . . .



SLIP-FROM-PAD record system is installed.

ADEQUATE delivery of supplies to stations is assured.

When the group plan was in effect, broccoli or asparagus pieces which had been trimmed, inspected and cut to size for packaging, were delivered to a group of workers stationed along the side of a conveyor belt.

These operations were then performed in this sequence:

1. Workers, called "rearrangers," sorted the material according to grade and transferred it from the wide central belt to a narrow parallel belt. The latter belt, in turn, carried this prearranged material to the packaging stations.

2. Then workers at the packaging stations transferred the material from the narrow belt to the containers. These were placed on another narrow belt which carried the packages to the check-weighing stations.

3. Finally workers at these locations transferred the now correctly check-weighed packages onto another belt, and it carried the finished packages into the wrapping machines.

Operations all along the line were on a group-incentive basis. The increment of additional income, dependent upon production above norm, was based on the daily production rate of the entire line. Of course, each individual's percentage share of the bonus was the same as that of every other.

New Method

No longer are packaging and check-weighing separate operations. Now each worker who fills a package also brings it to correct weight before placing on the conveyor belt for delivery to the freezer-tray racking station.

To make this operation possible on an individual incentive basis, it was necessary to deliver product to check-weigh packers in measured amounts. Proportioning product into units is now done by a group of individual incentive workers stationed along the side of the conveyors from the trim-inspection stations. These employees transfer and arrange product in uniform amounts in tote boxes. This provides a unit on which to base individual performance calculations and bonus payments.

The new incentive system operates this way. A worker who has filled a tote box tears a coded and numbered slip from a pad provided, places the slip on top of the product in the metal box, and then transfers the box to the lower deck of a two-deck conveyor system. A belt on the upper level returns empties.

Filled boxes proceed to the package-filling and check-weighing stations. Here a worker removes a tote box from a conveyor, retaining pre-arranger's numbered-coded slip. Though pre-opened cartons arrive continuously by conveyor at fill-and-weigh stations, each worker maintains a "personal supply" cached in a corrugated case. Cartons are filled from tote boxes, check-weighed, and then placed on the conveyor.

At the end of the day or shift, production of each fill-and-weigh worker is determined by the number of slips accumulated. Each box arranger's production is determined by the number of slips according to the code on them. Code mark is the same on each pad. Numbers are consecutive. Tabulation is thus simplified.

When these production lines were on group incentive entirely, average output was 200 units per hour per worker. Present average rate is 303 units per man-hour, in spite of the fact that each packaging station worker now performs a dual role.

Performance of some individuals is remarkable. A few sustain a production rate of 400 units per hour. One worker throughout last year's season held an average hourly output of 510 units—at times attaining a considerably higher production level.

Why Incentive Clicks

How does a worker attain a high level of performance? What is the mechanism of accomplishment?

First of all, the high production rates attained are not the result of furious self-driving, nor are they the result of pressure from supervisors. Driving, crowding, forcing—whatever the terminology used—raises the fatigue level, lowers output.

A successful individual-incentive worker subconsciously, if not knowingly, performs a series of time-motion studies in perfecting a dexterity which permits the most output with the least effort. Incentive workers soon learn

that when they drive themselves fatigue builds up and output slumps. The deft movements of the most efficient producers seem to be accomplished almost without effort.

Though this self-paced speed-up is the result of precision movements, nevertheless it seems not illogical to ask: "Doesn't quality drop—and fill vary?"

The answer is "no"—for this reason: There is a control system based on quality that influences bonus payments. As a result, the quality level of trimming and of the inspection following it is higher today than when group incentive was general. And it is far higher than during the time when there was no type of incentive at all. Also, most encouraging is the fact that the quality level of the speediest individuals is usually above the average for the group of individual incentive workers.

This is the procedure for maintaining top performance level.

Optimum quality of finished packaged product has been established. All workers are instructed and made familiar with the level of standard required. A small percentage tolerance below standard level is permitted without penalty. But, any drop below this tolerance level brings a percentage deduction from all bonuses, regardless of whether they are group or individual. Even though the production rate for the individual worker has been almost doubled, deductions for quality deviations are infrequent and then usually slight.

Enlightened Industrial Relations Procedure

Several vital factors in good industrial relations are demonstrated by Seabrook's experience with individual incentive:

1. It is vital to take workers into the company's confidence—to provide details of procedure, explain the reasons why, and post an itemized account of the results. It is not sufficient to report in general on the results obtained. Details are vital. Also, it is important to report to the individual regularly on his own performance. Furthermore, whatever the subject—and no matter how large or how small the item discussed—all explanations should be completely honest.

2. Every individual wants recognition – frequently – constantly. Who with ambition doesn't want to know "how am I doing?" Who, though he have very little ambition, is not stimulated by evidence of his own progress. Even though a worker may believe that his work is satisfactory, he wants to know, nevertheless, what his boss thinks of his efforts, how his company rates him as a worker. Then he may hope to answer one of the most vital questions, "how secure is my job?"

3. The increased output per worker at Seabrook Farms confirms the belief of many industrialists. Individuals seldom deliver maximum output. On the average, the production delivered by workers is but a fraction of their potential. Full output per worker should be considered from two viewpoints. To be sure, the manufacturer gains as production per worker increases; but the worker gains, too. Working at full output is not only satisfying to the worker, but also gratifying. When full ability is exercised, time on the job seems condensed, fatigue minimized, boredom avoided. A generally high employee morale results.

4. Seabrook's experience demonstrates that it is folly to wait until "some other time" to settle a misunderstanding, a grievance. Settle it now. No matter how apparently trivial, nor how distorted or biased the view of the individual may be, consider such a "condition" in an employee as though it were a deadly virus which may soon infect all employees. Meet it fairly, meet it firmly—and at once—before it reaches the infectious stage.

Success of the incentive plan at Seabrook's, and also the success of such plans in any other food plants, provides evidence that the companies where the plans work out have considerate and effective industrial relations with employees.

And sound industrial relations is the only foundation on which good public relations can be constructed.

BROCCOLI PACKING PERFORMANCE AND BONUS RECORD PACKING BROCCOLI

Day Monday DATE November-8-19- SHIFT Day LINE 2A

		SEABROOK FARMS CO INDIVIDUAL PIECE WORK	1 PAN (Tickets)	2 Lbs	3 Hrs on Std	4 Av. lbs. Hr	5 #2 over Std	6 Bonus per Hr	7 Bonus Each	8 Bonus less Penalty	B W	POST	PRODUCTION LEGEND
1	Button	Name	–	1 X C	–	2 – 3	4 – D	5 X E	6 X 3	7 – H			10 oz Ctns
2	3117	Mary Smith	100	1900	8.0	238	71	.30	1.60	1.58			
3	3007	Dorthy Jones	125	2375	8.0	297	130	.39	3.12	3.09			
4													
5													2 lb. Ctns
6													Packed

	INDIRECT BONUS To receive 100% of Pk. Av. Bo. Ind Hrs. must be no more than 10% of Pk. Hrs.									Pk. Av. Bo./Hr II ÷ I
			B	A	I		G		II	
22		Forelady								F
23		Mach. Operator								Ind. Av. Bo./Hr.

DAILY PACKAGE fill and weight report on individual performance and bonus earnings designed so workers can check calculations. Thus errors are caught at once, misunderstandings avoided. Column at right also includes: B, total pans; C, average pounds per pan (H ÷ B); D, standard production, pounds per hour; E, cash value, 100 lb. per hour over standard; F, Individual average boxes per hour (1 × X% ÷ Ind. H × F); G, workmanship penalty.

Plan Must Be Workable

Not only must either an individual or group incentive plan be workable—the plan must be made to work.

One of the most essential steps in making a workable plan work is to explain and justify the procedure in such detail that everything about the entire operation is fully understood by all workers. Not only should this be done at the start, but it must be repeated.

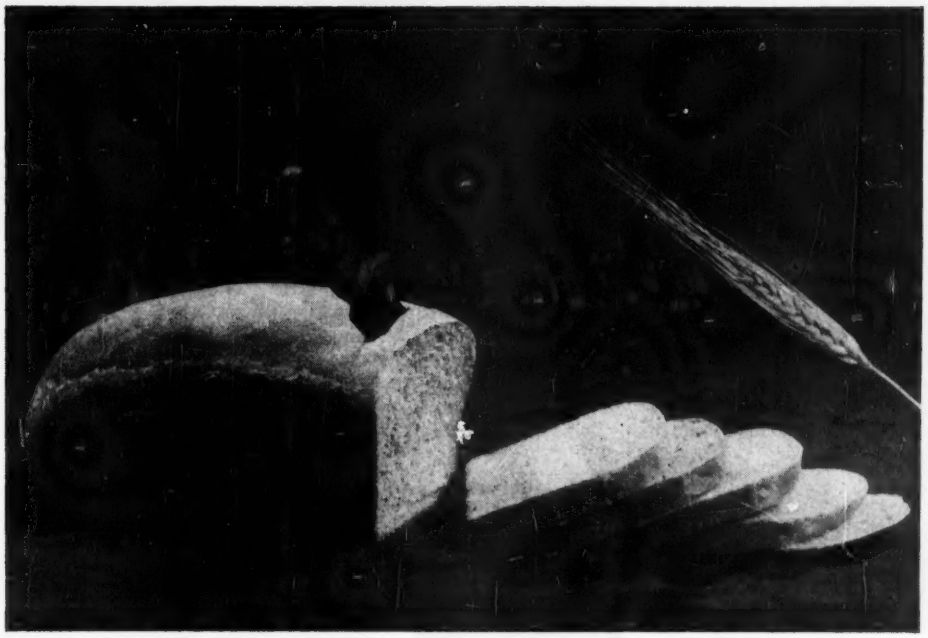
Incidents will occur and conditions develop not anticipated at the start. Immediate adjustment and explanation of the changes called for must be made clear to everyone and at once.

Here's an example.

Soon after operation started on the individual incentive plan, some of the sorters on the broccoli line failed to fill the tote boxes. Also, some overfilled them, stacking pieces so high that portions spilled on the floor to become waste. Acceptable explanation to the workers, to assure exact container fill, required proving to them that either under-fill or over-fill of boxes reduced the bonus earnings of both group and individual incentive workers.

Pointed out by a time-motion study demonstration was the fact that handling time involved in transferring under-fills to and from conveyors reduced the volume of output. Since bonus calculations are based on total pounds of finished product produced by the line, two half-filled boxes produced no more final production than one filled box, but nevertheless required double handling and increased fatigue. (Turn to page 227)

The Whole-Grain Loaf . . . Wheat's Salvation?



"Stone-Ground" Livens Market

Reverting to ancient way of milling whole-wheat berry between stone wheels, many bakers have found so-called "natural loaf" a promising way to regain consumer favor

FE STAFF

Millers and bakers alike view with growing alarm the per-capita decrease in wheat products consumption—now less than one-third the going rate prior to this century.

Many reasons are advanced for this decline: Competition of countless new process foods. . . . Greater expenditure of the growing food dollar for what were once prohibitively expensive items to much of the population. . . . Inordinate stress on starch-free "slimming" diets.

Wheat users readily admit that these are valid reasons. But there is a factor that makes them doubly concerned: Despite their vigorous and often spectacular attempts to arrest the drop—it still continues. And yet consider some of the remarkable advances in milling and baking technology over the past 25 years. This was the era of applied sanitation, protective packaging, enriched flour, mechanized uniformity in baking. There is no doubt that the upgrading in purity, uniformity, and attractiveness of wheat products has been profound.

Certainly frustrating, but even so there is a small-but-growing, optimistic group in baking circles that feels a turning point in the consumption of wheat products—particularly the mainstay, bread—is gathering shape.

These bakers are the exponents of the whole-grain or "natural" loaf. They claim that all that is needed to win back the market is to give people "the basically better product that grandmother used to bake."

Actually, this ingeniously simply answer to a big problem has some powerful arguments behind it. Witness the tremendous success of bakery firms such as Pepperidge Farms and Brownberry, which are founded on the whole-grain philosophy.

Add to this the significant and growing number of small wheat grinding mills finding use in the home for kitchen baking. And the mushrooming number of small commercial millers vending stone-ground flour.

Proponents of the whole grain loaf are quick to advise that they are not involved with an echo of the many "health bread" or whole-wheat promotions of the past. These, they insist, were no answer, with their high pricing and fabulous claims. And besides, most still involved the basic error of employing conventionally milled flour.

Cornerstone of the whole grain approach is to bake a fresh ground flour derived from all parts of the wheat berry—including the germ and bran.

By including the germ, they believe that some solid nutritional advantages over conventional bread accrue. But much more than that, they stress that this portion in fresh ground flour contributes a characteristic odor and flavor with a tremendous, and nostalgic, consumer appeal.

To secure this whole grain flour, its advocates have had to return to the age-old method of stone grinding, which preceded the steel roller in milling evolution. For the efficient steel roller system was actually designed to continuously separate the flour from germ and bran, which could clog the mill in subsequent reducing passes.

True, the stone mills now in use

are a far cry from yesteryear. They have been motorized, and the flour is ground between a stationary and a moving carborundum wheel with forced air cooling. And the grinding wheels are so designed and spaced that the grain is not crushed, but rather tumbled between abrasive surfaces and reduced to flour with little heating.

Thus, the entire grain kernel, including the germ, is ground into the flour—in fact it would be impossible to remove the germ in this grind.

Since this flour, with its germ-contributed fat and protein, is highly palatable to insects as well as humans and is liable to oxidation, it is at its best when used on the same day of grinding. Hence most commercial operations integrate their stone milling directly in the mixing and baking line.

However, it is possible to retain the initial whole-grain advantages by low temperature storage, and most of the supply millers now recommend storing the sacks under refrigeration.

Due to improvements in stone grinding equipment, whole-grain advocates now have an answer to one of the toughest objections sent their way —the well-known irritating effect of constant bran intake on the human intestine.

By proper stone design, the entire grain—bran and all—is reduced to fine flour. Hence these irritating particles are rendered harmless. Also, sifting funnels can be attached below such mills to separate any stray coarse bran or to make a cream-colored flour.

Bakeries are taking to in-plant whole grain milling in growing numbers. Of course, the growth of Pepperidge Farms—which stone grinds all its own flour—is legend. Today, the fifth huge plant of this company is under construction in Los Angeles, and production of its loaves has soared to a rumored 7-8 million loaves a week.

Fuchs Baking Co. in Miami reports splendid success with its whole-grain program. It has installed four stone mills with a total production of 8,000 whole-grain loaves a day. It sells these at a premium of about 6¢ per loaf—and sales are ever increasing.

Others getting into the "natural loaf" market are McGough Bakeries in Alabama with three mills, Keyl Baking in Jamestown, N. Y., also with three mills, and about a dozen other bakeries widely scattered in the U.S.

Case History of a "Whole-Grainer"

Harold and Mildred Smith of Nauvoo, Ill., were very fond of home-baked bread—enough to search out an ideal North Dakota wheat variety, buy it in bulk and grind it as needed. Mildred's bread was superb, and increasing demand from family and friends nudged her into volume activity. So the Smiths were "in business."

Word of the excellent bread spread into nearby Iowa, and a State College dietitian collaborated to perfect its recipe. This launched the bagging and sale of whole-ground flour under the "Nauvoo Miller" label—sought by local grocery stores and bakeries as far distant as Independence, Mo.

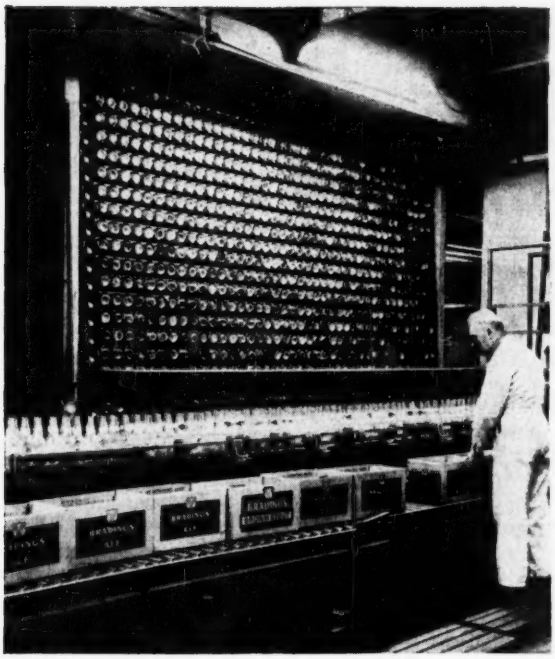
This picture story reveals the step-by-step progress.

1&2 FIRST MILL put to work was small family unit (left photo). It ground only 2½ lb. per hour. Harold Smith built the 15-lb. supply hopper. Right photo: Oven-fresh whole-grain loaves baked by Mildred Smith in her kitchen range brought many calls from friends. Recipe was later perfected with help of Iowa State College home economics expert.

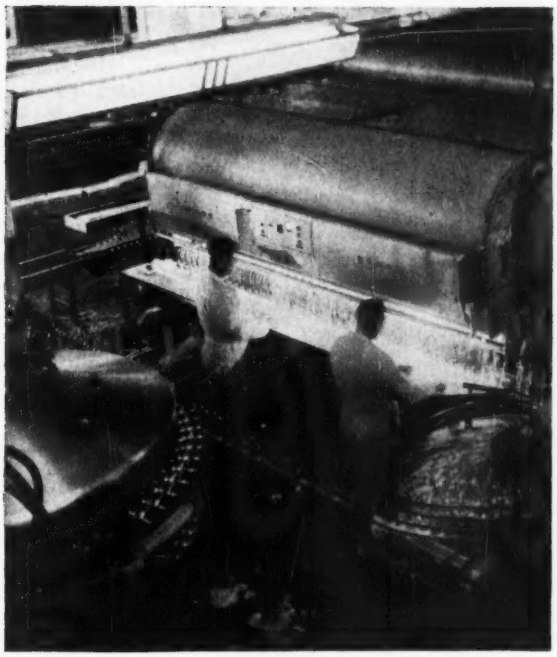
3 SPECIAL WHEAT, selected for its baking qualities, was bought in carload lot and stored in this big steel bin, set up in backyard. Later, another similar bin was added.

4 VOLUME MILLING was started with home-made mechanical cleaner (left) for separating chaff, and (right) abrasive cleaner—similar to actual stone grinding mill—that polishes dirt off berry surface for sifting below. Photo shows load going in.

5 STONE GRINDER (right) has a capacity of 25 lb. per hour, is powered by a 1½-hp. motor. Similar larger units have 60-lb. capacity. Nauvoo flour is shipped in 12- and 24-lb. bags.



RETURNED bottles are conveyed to gang loader that fills 40-bottle-pocket carriers at 12-13 carriers per min.



CLEAN bottles are lowered on discharge conveyor. Unscrambler sends them in two lanes to fillers.

World's Largest Bottle Cleaner

More Than Doubles Filling-Line Capacity

Canadian brewery revamps bottling layout around special 500-per-min. washer that multiplies the performance without "spending more space"

JAMES MONTAGNES
Toronto, Canada

A new bottling line—equipped for maximum production in minimum space—is greatly augmenting output at Brading's Breweries, Ltd., Ottawa, Canada.

Specifically, it has enabled the brewery to up production by more than 125% in approximately the same space as occupied by the previous bottling line, and with no major structural changes.

Key to the large increase in output is the new soaker bottle cleaner with a capacity of 500 bottles per minute. This unit was built to Brading's specifications by Barry-Wehmiller Machinery Co., St. Louis. It's said to be the largest and most modern in the world.

Has 40-Bottle Carriers

In operation, cases of returned empties are received and inspected in the bottleshop basement, where bottles are removed and fed by a conveyor chain to a Barry-Wehmiller automatic gang loader. Feeder mechanism automatically places the bottles in the 40 pockets of each carrier as it moves past the gang loader station at a rate of 12-13 carriers per min.

Loaded carriers move vertically and continuously from the basement to the bottling room. Here, the bottles receive a pre-rinse before entering the first soaker compartment. Then they go to the caustic chest, which combines dormant soaking with a highly effective hydraulic washing action wherein the bottles, in both the upright and inverted positions, are subject to a pressure wash.

While in the upright position, bottles are agitated on rocking grates to facilitate label removal. As they are removed, the labels drop onto a vibrating screen that conveys them out of the machine.

Bottles are then inverted and moved over additional caustic sprays, timed through a rotary valve to be intermittent in operation. This permits the bottles to drain empty between sprays so that the scrubbing effect of each successive spray is fully utilized to insure efficient cleaning of interior surfaces.

Then the bottles pass through two additional soaker compartments and to the washing section, which comprises two parts. In the first, they are cleaned with water at 100 deg. F. and 70 lb. pressure—three times inside and twice outside. In the second or final phase, city water at 40 lb. pressure is used to rinse the bottles three times inside and twice outside—in all, 6 times inside and 4 times outside.

The clean, cool bottles are now discharged onto a lowering table that feeds a 2-lane platform chain conveyor on which they pass inspection stations before entering two Cemco fillers.

It takes about 15 sec. for bottles to

(*Turn to page 182*)

What's *Your* Plant's Sanitation *Quotient?*

For quick answer, "box score" your operation on this key list of 42 major sanitation duties—by pencil-checking all the activities you don't carry out, or handle unsatisfactorily . . . More than 10 checks: Your program could use a revamp; 5 to 10: Spotty, needs attention; 1 to 4: S.Q. near top. But any checkmark calls for action—The Editors

Just what are a plant sanitarian's duties?

At all the General Foods Corp. divisional plants, he is responsible for attaining—and maintaining—the *highest* standards of sanitation, in compliance with the provisions of the Food & Drug Act. Conformance with state and local regulations is also essential.

Wherever remedial action is necessary to attain these standards, he should apply his working knowledge of entomology, zoology, sanitary engineering, public and personal health, bacteriology, insecticides, rodenticides, and cleaning compounds.

He is also responsible for receiving FDA inspectors during their periodic check-ups, assuring them that operations are being conducted according to their requirements.

More important, perhaps, he must be familiar with the activities of the FDA and other regulatory officials. And he must keep management informed of them.

Now to a list of the 42 cogent duties of the plant sanitarian at one of the GF plants—

1 He should inspect, in a thorough manner, two or more departments weekly, along with manufacturing superintendent, control chemist, housekeeping department foreman, and department foreman. In this way, entire plant is thoroughly inspected each month. During inspections, he must observe any possible deviations from sanitary standards. And, if any are noted, he must recommend corrective action. . . ☐

2 Observe sanitary conditions during a weekly inspection of entire plant and follow up on compliance with previously made recommendations and suggestions. . . ☐

3 Accompany federal, state, and local agents during their sanitary inspections of plant. Then submit reports of their comments, findings, and recommendations to general manager, production manager, manager of research, director of purchasing, personnel director, law department, and corporate assistant for sanitation. . . ☐

4 Review and check into any complaints relating to insanitary plant conditions and report findings—to same company personnel as named in (3). . . ☐

5 Check for possible contamination or infestation of materials and equipment in event of a sprinkler break, fire, or spillage. He must then recommend corrective action. . . ☐

6 Examine incoming raw materials and packing supplies for possible contamination or infestation, and make proper disposition of any contaminated or infested materials. . . ☐

7 Inspect all common carriers (trucks or freight cars) suspected of contamination or infestation before goods are loaded for shipment. . . ☐

8 Examine raw materials and packing supplies stored in plant for long periods, and recommend any necessary disposition. . . ☐

9 Check, with quality control supervisor, all returned goods for possible contamination or infestation, and then make proper disposition. . . ☐

10 Investigate and follow through on customer complaints pertaining to sanitation and infestation. . . ☐

CHARLES Le TOURNEAU
Sanitarian, Walter Baker Chocolate & Cocoa Div. of General Foods Corp., Dorchester, Mass..

11 Offer technical advice to sales department on problems relating to sanitation and infestation. . . ☐

12 Visit customers' plants, at request of sales department, to investigate infestation problems. . . ☐

13 Serve as liaison in event any lots of incoming raw materials are held up by FDA for alleged contamination. . . ☐

14 Direct compliance with decisions of territorial health authorities. . . ☐

15 Maintain liaison with all regulatory sanitation agencies and participate in their activities. . . ☐

16 Keep in contact with contract exterminator and supervise his activity on insect and rodent control in plant. Also, follow up exterminator's work and report results to manager of research, production manager, general manager, and director of purchasing. . . ☐

17 Anticipate demands and requirements of any sanitary code that

might affect plant and operations. . . ☐

18 Make recommendations for fumigating, as well as organize, coordinate, and supervise fumigations—and, when necessary, contact consultant fumigators. . . ☐

19 Assume responsibility for use of proper fumigants, insecticides, and rodenticides. . . ☐

20 Issue notices pertaining to fumigations to personnel and departments concerned, as well as to outside agencies, so that necessary safety precautions can be observed. . . ☐

21 Consult manager of research on sanitation problems, and advise him of all activities beyond scope of normal operations. Forward to him, for consideration, any recommendations and suggested improvements pertaining to sanitation program. . . ☐

22 Review sanitary aspects of plans for new equipment, construction, installations, alterations, or additions. Then approve plans that meet accepted sanitary standards, or disapprove those that don't, offering recommendations for correction. . . ☐

23 Determine, after observation and laboratory tests, the equipment and projects needed to maintain or improve sanitary conditions. . . ☐

24 Analyze and evaluate cleaning equipment and supplies. . . ☐

25 Check results of tests made biweekly on possible extraneous matter in all finished products. . . ☐

26 Offer advice on plant lighting, heating, and ventilating in any case where they are deemed to have an adverse affect on plant sanitation. . . ☐

27 Inspect equipment for possible contamination, infestation, or conditions leading to contamination or infestation prior to transfer of these units from production to storage or from storage to production. . . ☐

28 Participate with general foreman and plant superintendent in establishing a standard of sanitation and standard cleaning practices. . . ☐

29 Propose and assist in practical research on effectiveness of fumigants, insecticides, and rodenticides . . . ☐

30 Submit reports necessary to inform management of activities pertaining to sanitation plant. . . ☐

31 Carry out special sanitation assignments directed by general manager and manager of research. . . ☐

32 Participate in annual corporate sanitation conference designed for exchange of information and discussion of methods and developments of sanitary practices that are in accordance with company's sanitation code . . . ☐

33 Conduct special research investigations on sanitation problems at request of manager of research or company's staff assistant for sanitation. . . ☐

34 Incorporate all changes in the company's sanitation code. . . ☐

35 Maintain a file of records pertaining to sanitary activities. . . ☐

36 Check adequacy of existing sanitation facilities and their conformance with federal, state, and local requirements. . . ☐

37 Keep abreast of newly pertinent developments in entomology, zoology, chemistry, and commercial poisons through current literature and in meetings held at plant. . . ☐

38 Interpret and disseminate information to supervisors on latest developments in sanitation. . . ☐

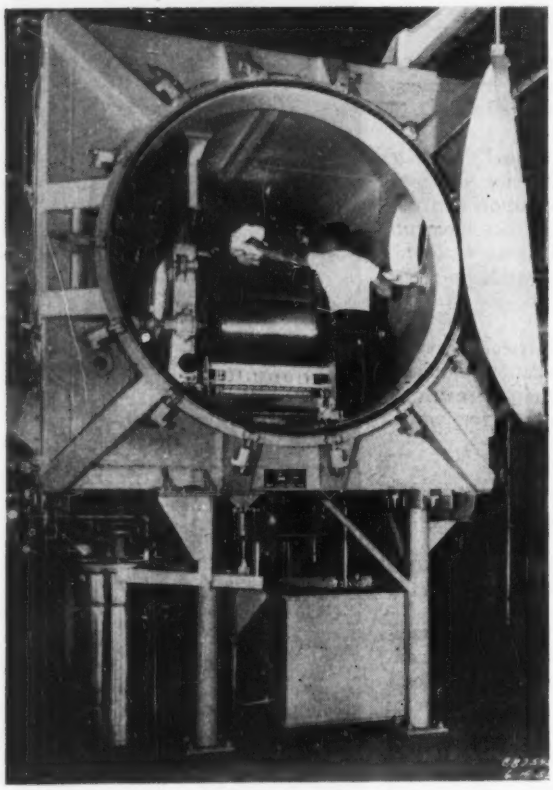
39 Formulate and submit recommendations to manager of research on methods of improving sanitary operations, eliminating waste, and reducing costs in order to attain maximum efficiency. . . ☐

40 Attend monthly safety meeting and submit recommendations to safety committee on sanitation. . . ☐

41 Recommend measures of sanitary significance for purpose of protecting physical well-being of employees. . . ☐

42 Conduct classes in sanitation for supervising personnel in order to promote interest in sanitation program. . . ☐

YOUR SANITARIAN plays essential role in keeping your plant ship-shape. He pays off handsomely in money and product savings by barring contamination from incoming supplies, inspecting plant operations and conditions, and examining finished products. Here, he checks trailer-load of chocolate before it leaves plant.



WORKING MECHANISM in "packaged" dehydrator.

SPEED-DRIES

Heat Sensitive Liquids

In matter of seconds, new continuous hi-vac unit removes moisture from concentrated liquids or slurries to 1% residual. Flaky product is very soluble and free of cooked flavor. Cited on coffee, method is widely applicable to other foods

FE STAFF

A new method of removing moisture from a 38-40% solid-content concentrated coffee solution produces "instant" coffee in dry flaky form.

It has been in commercial operation since the summer of 1952 at Penndale, Inc., Lansdale, Pa.

Continuously drying the solution under high vacuum down to a stable readily-packaged product of approximately 1% moisture content, the unit has also been applied to remove moisture from other heat sensitive foods.

Among these are milk, molasses, protein hydrylosate, tea, fruit and vegetable juices, and vitamins from citrus waste. Indicated also are applications to baby foods, nutrient reinforced cereals, pulped fruit and vegetables, egg whites, and others.

The unit at Penndale's, made by Chain Belt Co., Milwaukee, employs three-stage steam jets for drawing vacuum in the drying chamber. It has a capacity of 125 lb. water vapor per hour at 6.5 mm. of mercury absolute.

Maintenance of uniform vacuum is made possible by a controller-operated valve in a by-pass connected between suction and discharge lines of the steam booster. Return of discharged steam and vapor to the suction connection of the booster is regulated by instrument to maintain the suitable degree of vacuum.

This control system holds vacuum within a fraction of a millimeter of mercury, a performance essential to final quality, since the density of the end-product varies directly with changes of pressure in the processing chamber.

Vacuum compartment is 8½ ft. wide, 8½ ft. high, by 13 ft. long. Installation space needed is 16 x 18 ft., and overall height requirement is under 17 ft.

A larger size dehydrator of this type also has a rectangular vacuum chamber. Overall length of this unit is approximately 30 ft., requiring floor space, exclusive of aisles, of 16 by 30 ft. Head room can be held to as little as 20-25 ft., depending on the arrangement of the steam jet equipment, which is proportionally larger.

Installation costs at Penndale were held at a minimum due to the fact that the dryer was shipped as a packaged unit, with interior equipment erected in place.

Mounted inside the vacuum chamber are two drums serving as pulleys for a 2 ft.-wide continuous stainless steel belt. Larger of the drums, 6 ft. in diameter, is heated by steam; the smaller is cooled by water. Dryer is so designed that these and all other mechanisms are readily accessible for cleaning or for adjustment.

Roasted, blended, ground coffee is extracted, and the liquid obtained is concentrated under vacuum to a solution containing 38-40% solids. As this concentrate is introduced into the vacuum chamber it is deaerated in a Pyrex glass pipe before delivery to the feed pan. Thus avoided is uneven drying due to air escape during the moisture removal cycle.

The liquid is transferred from a feed pan to the stainless steel belt in a film of controlled thickness. A roller, partly submerged in the feed pan, transfers the liquid to the belt on its lower travel.

Thickness of the layer to be dried is governed by two factors: Speed of the feed roller (adjustable from the outside of the dryer), and also clearance between this roller and a supporting back-up cylinder located above the feed roller and on the opposite side of the belt.

By means of an electro-mechanical tracking system, the stainless steel drying belt is kept in alignment regardless of temperature changes or other variations. Drying surface may be renewed merely by replacing the stainless steel belt --an operation readily performed. Steam and water connections to the drums are through rotary joints inside the

vacuum chamber, thus minimizing the number of rotating shafts passing through the wall of the vacuum chamber. At several locations windows are provided for the inspection of the equipment and for observing the drying process. Interior of chamber is lighted during processing by external lights fitted outside the windows.

Within narrow limits, the production rate is almost directly proportional to the percentage of solids in the material being dried. It is, therefore, economical to remove as much water as practical in the preliminary concentrating operation. This is usually done by vacuum evaporation or by freeze-centrifuging. Capacity of unit will vary, of course, with different products, depending on the concentration, heat sensitivity, ease of drying.

Belt on which drying is carried out travels at a speed of approximately 50 fpm., providing a product drying time of slightly over 13 sec. Total elapsed time between applying the material to the belt and removing it as finished product is approximately 27 sec.

Instrument controlled radiant heating units, located over the major drying surface of the belt, increase dryer output approximately 100%.

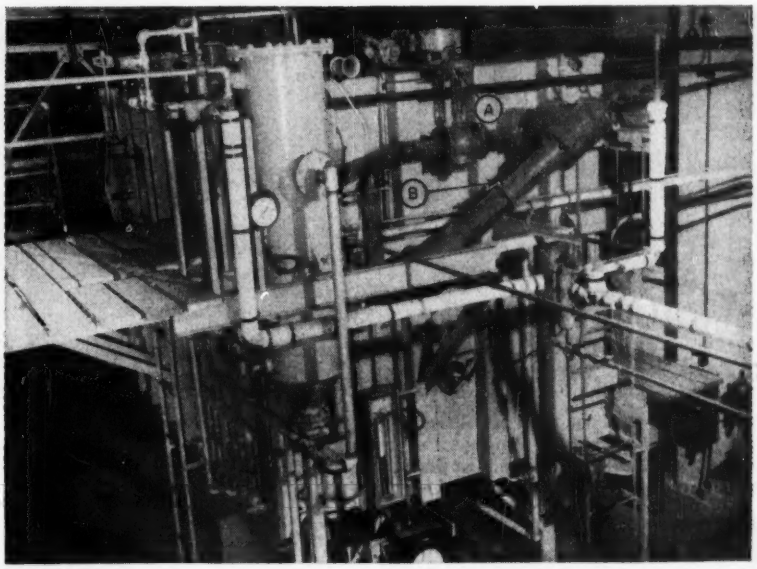
When the product leaves the drying area it is immediately cooled as belt passes over the cooling roller and before coming to the doctor blade.

During this cooling cycle, product is made crystaline in structure, thus solubility factor is enhanced and removal from the belt facilitated. Cooling also minimizes time the product is exposed to elevated temperatures.

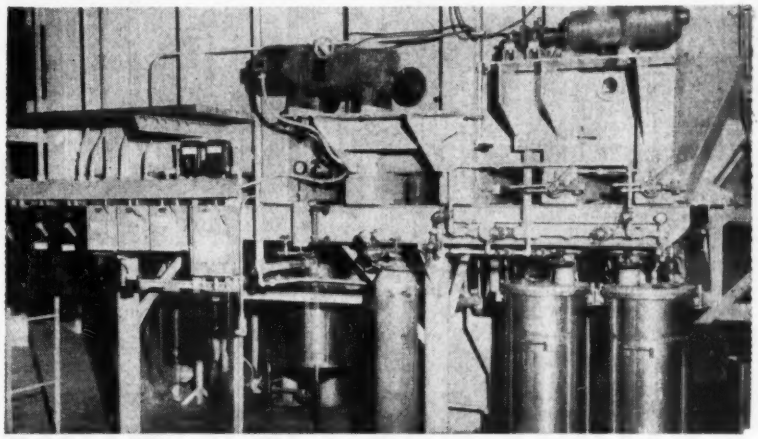
A pneumatic system outside the dryer permits adjustment of the force with which the doctor blade bears against the stainless steel belt. Also, this force on the blade, which oscillates laterally to insure uniform wear on its cutting edge, can be removed until dried product appears on the belt. As a result of these blade controls, 50-100 hr. of operation are obtained between blade sharpenings.

Dried product at the rate of 125 lb. per hour discharges alternately through two air locks into receivers, each of which holds the amount of finished instant coffee produced during a 10-30 min. interval. Clamping of receivers to dryer is aided by air cylinders.

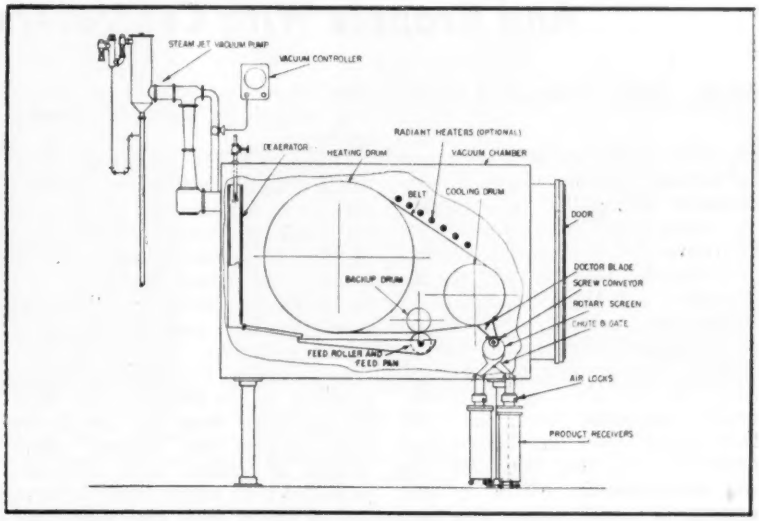
Reported advantages of the new vacuum dryer are its ability to dry at relatively low temperatures and in the absence of substantial oxygen. Also of importance is unit's ability to cool the product immediately after drying, time cycle for which is of short duration, usually 10-30 sec. Also cited is the high cold-water solubility of the dried materials, which show an absence of cooked or processed flavors.



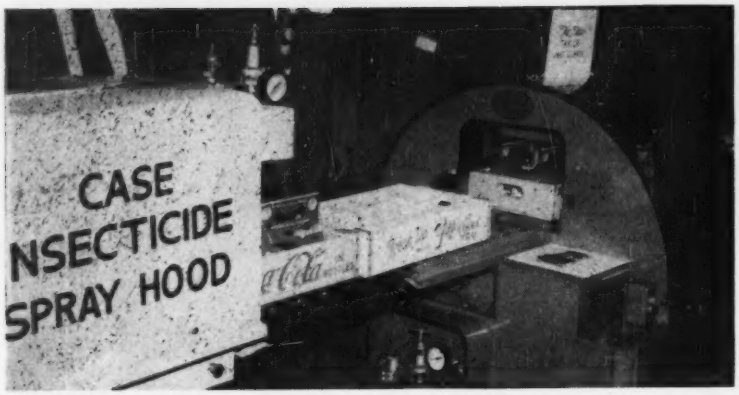
VACUUM control instrument (A), located on by-pass around booster (B), maintains uniform pressure in dryer.



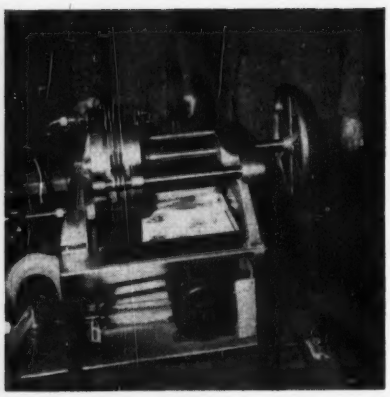
METAL containers, pneumatically lifted for clamping, alternately receive product discharged via air locks.



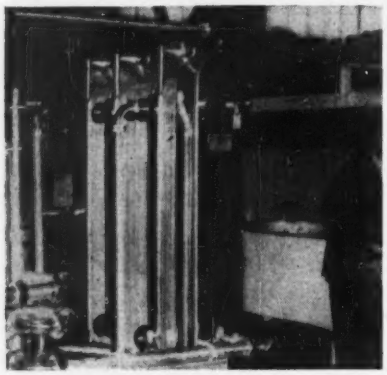
MECHANISM for applying solution to dryer belt.



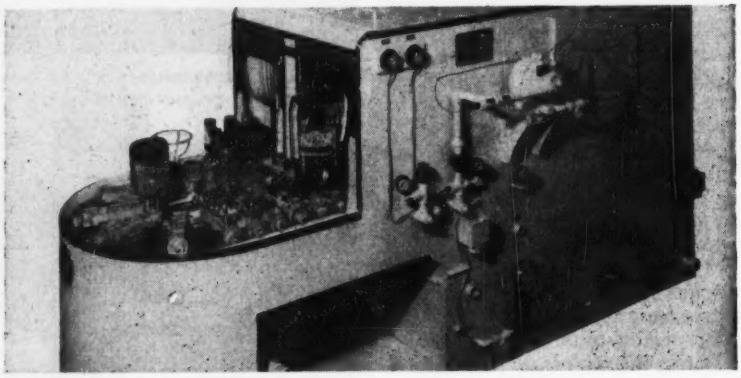
CASES are cleaned, then sterilized in these units. In cleaner (right), case gets blasts of air as it stops at two points during rotation (air discharges through dust collector), then moves to hood for insecticide sprays.—Bottlers Appliances, Salisbury, N. C. (38A)



LARGE filtering area characterizes compact, stainless filter. It's complete with pump.—Frank B. Lomax Div., Groen Mfg. Co., Chicago. (38B)



IMPROVED heat transfer with zig zag plate is claimed for this unit.—Cream City Boiler Co., Milwaukee. (38C)



ADAPTABILITY to all size bottles from splits to 5-gal. is feature of small (11½ ft. long, 3½ ft. wide, 5 ft. high) washer displayed by Niagara Bottle Washer Mfg. Co., Toledo. (38D)

Bottlers See New Units at Chicago

And Grapple With Controversial Topics

What They Talked About

DISPOSABLE containers, both glass and tin, were the subject of sharp discussion among the 2,000 bottlers who gathered in Chicago recently for the convention of American Bottlers of Carbonated Beverages and the International Soft Drink Exposition.

This topic cropped up in several of the major addresses and was the "hottest" one handled by the "Current Problems" panel. At this specific session, expressions among the 1,500 bottlers and supply men ranged from predictions of a rosy future for cans and non-returnable bottles to dire warnings of possible competition from food packers and small breweries who already have the facilities and know-how needed for successful canning operations.

Other subjects discussed: The ABCB's part in establishing uniform deposits on bottles, cases, and cartons; the future of "sugar-free" beverages; methods of combating bad public relations with respect to schools and the dental profession; and the short supply and high price of sugar essential to production.

In line with long-standing policy, members of the Beverage Machinery Manufacturers Assn. did not display large units in this "off-year" show. Makers of smaller units, however, presented their wares. Some of these, picked up by FE's cameraman, are seen on these pages.

Officers elected for the coming year were:

President—E. Robert Anderson, Rochester Coca-Cola Bottling Co., Rochester, N. Y., Vice-President—Joseph F. Nerney, Pequot Beverage Co., Attleboro, Mass.; and Treasurer—Joseph La Pides, Pepsi-Cola Bottling, Baltimore.

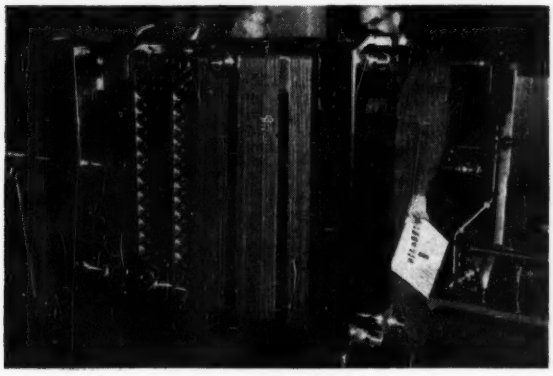
New members elected to the executive board: T. L. Wilson, Royal Crown Bottling Co., Charleston, S. C. and Ralph L. Webb, Royal Crown Bottling Co., Columbus, Mo. Re-elected to board: E. A. Bostrom, Coca-Cola Bottling Co., Grand Forks, N. D.; A. B. Hatcher, Top Rock Bottling Co., Charleston, W. Va.; and Frank Snell, Jr., Coca-Cola Bottling Co., Jacksonville, Fla.

FASTER loading and unloading is feature of versatile truck body that employs movable metal posts as dividers. For pallet or hand loading.—Worksaver Body Co., Cleveland. (39A)

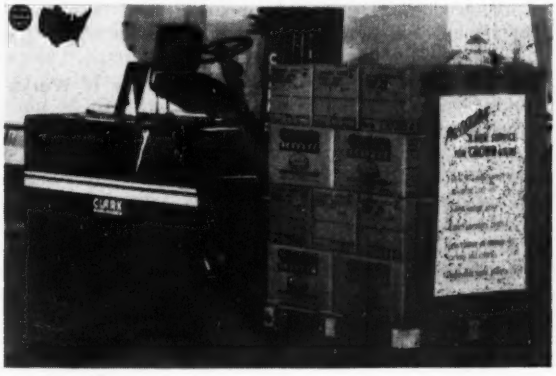
EASE of access to palletized loads characterizes "Low-Boy" delivery body. Has 6 pallet spaces, also compartment to carry advertising materials or empty cases.—Herman Body Co., St. Louis. (39B)

CANS (cone or flat-top) are automatically packed in carry-home cartons by Dacam system.—Old Dominion Box Co., Charlotte, N. C. (39C)

CARRY-HOME CARTONS are packed (4 in corrugated case) 70 per min. by new attachment to Bottle Master carton opener.—Atlanta Paper Co., Atlanta. (39D)



HIGH heat transfer, ease of cleaning, and ability to withstand pressures to 100 psi. are features of this medium capacity, all-stainless heat exchanger.—Walker-Wallace Div., APV Co., Buffalo, N. Y. (39E)



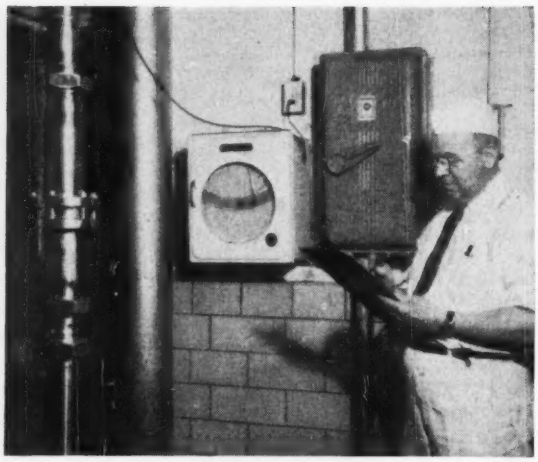
UNITIZED LOAD of crowns (32 cartons glued on disposable wood pallet) is designed to cut unloading labor, save storage space, reduce damage to cartons and crowns.—Crown Cork & Seal Co., Baltimore. (39F)

Want more information about any items in this picture article? Just circle the key numbers (end of each caption) on Readers Service coupon page 209.

Tabbing the Flow Spots Profits

By accurately metering and totalizing flow to process, Buffalo dairy pinpoints departmental efficiency

FE STAFF



PLANT MANAGER LEO BECK finds it easy to spot exact milk usage by reading totalizing counter (lower right corner of recording instrument). Sanitary flow pickup is located in 4-in. stainless piping (left).

Ask a typical dairy manager for his most annoying day-to-day problem and chances are he'll answer: "Keeping track of the milk I use."

Take a few small but consistent errors in gaging daily use from storage tanks to various process operations: Comes 5 o'clock and calculated yields can be either feeble or fantastic. And off sails the manager on a new tack, chasing that will-o'-the-wisp called efficiency.

To tie down milk utilization, many dairies go to calibrated surge tanks and "valved" delivery to each process. Dodds Alderney Dairy—the Buffalo division of General Ice Cream Corp.—tried this in estimating use of skim milk to drying operations. But despite careful supervision, results still were pretty much hit or miss.

Today this dairy believes it has licked this accounting dilemma with a recording flow station that not only charts feed to drying continuously, but actually adds up usage by weight.

Let's consider the specific problem—a typical one in many dairies:

At Dodds Alderney, each department is charged for the amount of milk used, hence strives for maximum yield to show good operating profit. But powdered milk—despite close tightening of the process—was always hard pressed to stay out of the red.

Skim milk to process was delivered through a "calibrated" hand valve setting, with use being totalized on a running-time basis. This valve setting was arrived at by running the skim milk into a calibrated tank and checking the exact time needed to fill this vessel. Thus a theoretical flow in pounds per hour could be adjusted on the hand valve.

In its routine calibration, the plant engineer discovered that the flow valve would often provide a widely varying rate at the exact same setting—a slight change in skim milk viscosity or delivery pressure would do this.

Subsequently, a Fischer & Porter sanitary flow meter was placed as a check in the delivery line before the process. Its bold record and flow integrator disclosed that, despite valve setting, the dry milk department was consistently being "shortchanged" in the quantity of milk delivered. And the accuracy of this meter report was assured to be within 1% by running its throughput into the calibrated tank.

Success of the continuous flowmeter in pinpointing true use of skim milk suggested its permanent location in the line. So now the unit is mounted directly downstream of a Waukesha non-foaming pump, and it meters over 125,000 lb. of skim milk to drying per day.

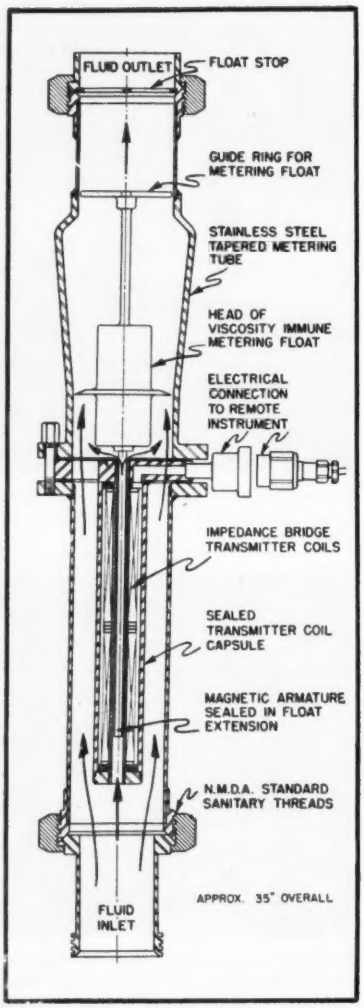
How It Works

Essentially, the new flow station consists of a "pickup" device located directly in the milk flow line, and an associated recording and totalizing meter mounted nearby on the wall.

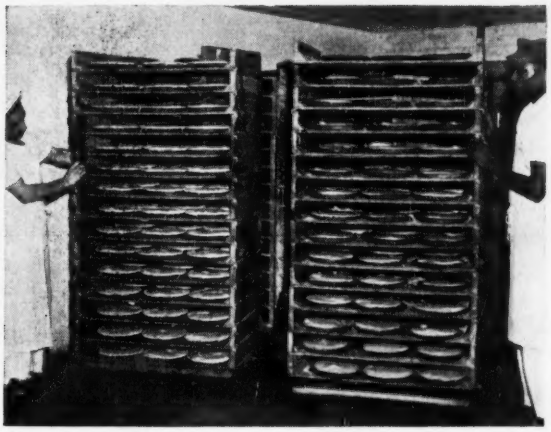
Externally, the pickup appears to be a slightly expanded pipe section, about 3 ft. long, in the 4-in. milk line. Like the line, it is made of stainless steel and is joined by standard sanitary connections.

Inside the expanded section is a viscosity-immune stainless steel measuring float riding freely with the upward flowing milk. Position of this float, hence flow rate, is determined

(Turn to page 190)


FLUID OUTLET
FLOAT STOP
GUIDE RING FOR METERING FLOAT
STAINLESS STEEL TAPERED METERING TUBE
HEAD OF VISCOSITY IMMUNE METERING FLOAT
ELECTRICAL CONNECTION TO REMOTE INSTRUMENT
IMPEDANCE BRIDGE TRANSMITTER COILS
SEALED TRANSMITTER COIL CAPSULE
MAGNETIC ARMATURE SEALED IN FLOAT EXTENSION
N.M.D.A. STANDARD SANITARY THREADS
APPROX. 35" OVERALL
FLUID INLET

FLOW PICKUP cutaway. Standard sanitary connections and design of components aid in-place cleaning.



DUAL-PURPOSE conditioning room is employed both for production control and for whipped-cream finishing operations. Left photo: Unbaked pies are stored in room at 35-40 deg. F., then baked as needed, to catch up with late orders. Walls of room are of cinder block and ceiling is Fiberglas-insulated. Water chiller is behind racks. Right photo: In one corner of room, custard-type pies are cooled, topped with whipped cream (prepared in three 60-qt. beaters), and stored for shipment. Behind workers is rack with u.-v. lamp that checks souring of pastry bags.

Production Knots—*Unraveled*

—by overanticipating daily pie orders, then baking enough to fulfill them and holding the balance in cold storage. Saves in line work. fruit filling preparation, labor costs

FRED BRAUN
Production Mgr., Jones' Pies, Inc., Hillside, N. J.

Double-barreled problem in our pie bakery was the task of streamlining operations to stabilize production and to reduce labor costs.

Most of the head scratching concerned anticipating daily orders and producing enough pies to fulfill them. To do this, we had to devise a method of keeping our production flowing—without interruption.

Nothing was more frustrating to our operating personnel than to produce, for example, 5,000 apple pies for the day and then get a request from the order clerk about 3 or 4 P.M. that our salesmen needed 6,000.

This meant a double-break in production—stopping, say, pineapple-pie-making operations and then again starting on the manufacture of an additional 1,000 apple pies.

What did this involve?

First, apple-pie filling had to be pulled out of cold storage. Or, even worse, we would find there was no filling available. This would mean disrupting operations in the cooking department. The three men involved would have to stop what they were doing and begin making more apple-pie filling. And meanwhile, the pie-making line was paralyzed.

Second, ten workers on the pie-making line—those operating the dough mixer, divider, and sheeter—had to set up the line again to produce the additional 1,000 apple pies.

Running short of apple pies was not the only headache. The problem could sometimes be multiplied 48 times, since production involved the manufacture of 12 varieties of pies made up in 4 different sizes.

Baking more than enough pies to meet daily orders was not the answer. Instead, the solution lay in a production-control system in which more than enough *unbaked* pies were turned out, and then baking just the number to handle the orders, while holding the remainder overnight in a conditioning room.

We now make, for example, 7,000 apple pies. Of this total, only 5,000 are baked. Then, should the order clerk put in a request for an additional 1,000, we merely get that many more "unbakeds" from cooler.

The other 1,000 stay in the room ready for use next day. With this backlog, the fruit pie-making order on the following day may run only 5,000 pies, of which 4,000 are baked and the rest kept in the conditioning the rest kept in the cooler.

This procedure is repeated with the other varieties.

Since the adoption of this system, our operations are now continuous. What's more, production costs have been sufficiently reduced to enable us to pay our workers a higher wage rate and yet achieve significant operating savings. Actually, we figure that labor costs have been slashed about 15%.

This system has benefitted us in still another way? We now have better control over our fruit pie-filling needs. In event we are flooded with large orders, there is no longer any need to prepare extra filling.

About the conditioning room: Built of cinder block and with ceiling insulated with 4 in. of Fiberglas, this 30x50-ft. room holds 70 racks, each loaded with 100 pies. Temperature of the room is kept at 35-40 deg. F., employing a 10-hp. water chiller equipped with two 10-in. blowers.

This conditioning room serves still another purpose. That is, a portion of it is used by the whipped-cream finishing department for cooling, topping (with whipped cream), and storing custard-type pies for shipment.

More important, this room has also enabled control of production of custard pies. Formerly, we had to start output of these pies about 10 P.M. so that they were ready for route salesmen by 2 A.M. Now, we can prepare them about 3 or 4 P.M., and hold them in conditioning room for shipping.

OVER 500 ravioli are turned out each minute by this fully automatic machine that first reduces dough sheet to desired thickness. Cutter then stamps out 8 rectangular pieces of dough at a time. Plungers force filling through dies and onto pieces, which are then folded and sealed as they drop through a pair of rolls and onto trays.

Teams Techniques to Nail Down

SPECIALTY-FOOD QUALITY

By applying processing "know-how," Buitoni now supplements its complete line of high-protein macaroni products with ready-cooked sauces, ravioli, lasagne, and other Italian favorites . . . Here's how—

JOHN V. ZIEMBA
Associate Editor, "Food Engineering"

Popularity of palate-appealing Italian specialty foods has greatly increased, particularly since the war. And because it has, some processors are getting a good toe-hold on their production.

Spurring this fast-growing demand were: (1) The flourish in the frozen ready-to-prepare meal business, and (2) the new impetus to American taste for these savory foods dating to the days the GI's were fighting in Italy.

Accordingly, Buitoni Foods Corp. has made a point of expanding the production of these items in its new, stream-lined macaroni and specialty foods' plant in Hackensack, N. J.

The one-story, truck-level facility covers an area of over 80,000 sq. ft. on a 4-acre plot, with an area for expansion to the south. It is constructed of brick and glass-block windows.

When original plans were drawn, 60,000 sq. ft. were alloted to the factory. However, it soon became evident that it was impossible to confine the plant within that space. Plans were then revised and the present facility is the result.

In fact from present indications, the area alloted for expansion is insufficient. So negotiations are in progress to acquire an additional 3 acres.

About one-quarter of the plant area is devoted to production of the specialty foods. The other three-quarters space encompasses macaroni manufacture and includes storage and offices.

High-Protein Macaroni

Over 40 different high-protein (20%) macaroni products are produced on three continuous lines—one for short goods and the other two for long goods.

Manufacture of these products involves a full line of lab-tested quality ingredients—high-protein flour, durum flour, semolina, wheat gluten, and wheat germ. It also requires use of highly pulverized, instead of regular, flour and semolina to avoid formation of undesirable, unattractive white specks in finished products.

All macaroni lines include the latest ingredient-proportioning devices,

automatic presses, continuous dryers, and high-speed packaging machines.

Two new items offered by Buitoni are the bite-size raviolettes and spaghetti twists with meat balls (20%-protein, corkscrew-shaped macaroni combined with meat balls and meat sauce).

Also manufactured are those ever-popular Italian favorites—lasagne, ravioli (with meat or cheese filling), pure grated Parmesan cheese, and the concentrated sauces—meat, marinara (meatless), and mushroom.

Quick-frozen, cooked-stuffed lasagne is made with alternate layers of broad strips of high-protein macaroni, combined with a stuffing painstakingly made of eggs, meat sauce, and three cheeses—ricotta, mozzarella, and Parmesan.

Sauces are prepared the way an Italian housewife would make them—by condensing, through slow cooking, top-quality ingredients to produce the combination of flavors that please connoisseurs. There is no adding of starch, flour, crackermeal, or breadcrumb thickeners. Only superior products are produced.

All sauces are prepared with California-grown, Italian-type egg tomatoes and olive oil imported from Lago Trasimeno—a region between Rome and Florence renowned for its high-grade olive oil, which is low in acidity and light in color, flavor, and body.

In addition to these major ingredients, marinara sauce contains only seasonings. Mushroom sauce has, in addition, a blend of Italian and domestic mushrooms, cheese, butter, and seasonings, while the meat sauce has beef, butter, wine, and seasonings.

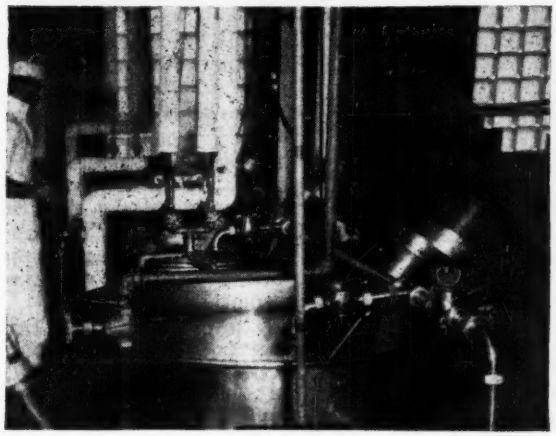
Ravioli Machine-Made

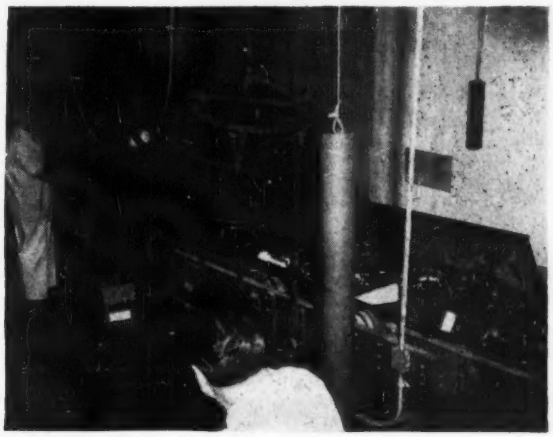
Briefly, the specialties are prepared as follows:

Anywhere from 960 to 1,120 ravioli per min. are turned out on a new line, which comprises a small dough mixer, miniature kneader, sheeter, and two ravioli-forming machines.

Operations start by preparing a 50-lb. load of dough in the batch-type mixer with a horizontal agitator. Dough is then chuted from mixer into the kneader or "gramola," which comprises a rotating circular stainless steel pan with two turning dough-working

(*Turn to page 229*)





PREPARING THE SAUCES

INTO THESE kettles go quality ingredients for manufacture of meat, meatless, and mushroom sauces. After long cooking, with agitation, sauces are filled into cans, then thermally processed in retorts.

CRATE-LOAD of canned sauces is automatically dumped onto heavy-duty unscrambler for single-file feed to wrap-around labeler. Later, can ejector checks for poorly labeled cans. Case packing, sealing follow.

GRATING, PACKING CHEESE

THIS MACHINE grates a 20-lb. wheel of cheese in about 2 min. Cheese is then spread on trays for drying overnight to moisture content of 18%.

JARS of grated cheese are loaded, 24 at a time, into this chamber for sealing under 25 in. of vacuum. Finally, jars are packed and sealed in shipping cases.

1 **MOLDED** blocks of fish fillets are band-sawed into small units.

2 **NEXT** step is to cut units into fish sticks (⅝x⅝x3 in.).

3 **"STICKS"** are coated with egg batter, then breaded.

FISH STICKS

Their Acceptance Mounts Processing Detailed

New convenience item, of uniform size and shape, wins enthusiastic reception in key test markets

FE STAFF

Very favorable market tests have fish processors believing that they now have a promising new item that will change our fish-eating habits.

It is the breaded, pre-cooked (deep-fat fried), quick-frozen fish stick. Each is ⅝ × ⅝ × 3 in., weighs 1 oz. And ten sticks are then put up in a retail size package.

As the processors see it, this specialty—which does not remotely suggest the common fish product—is likely to bring higher per capita—fish consumption (present per-capita figure is 16 lb.). There are several reasons for this: Consumer convenience, portion control, and merchandising advantages.

It takes the housewife only about 15 min. to prepare a fish dinner, when she is saved the customary cleaning and cooking. All this is done by the processor prior to freezing and packaging.

Equally important to the housewife, objectionable fishy odors in the kitchen and throughout the house are now a thing of the past. And being uniform in size and shape, the product is now much easier to "divvy up" at the table.

So, because of convenience and portion-control features, some processors are already eyeing the further possibility of invading the institutional trade with a large size package—5 or 10 lb. Gorton-Pew, for example, is now packing 36 portions (4 oz.) to a carton, and five 9-lb. cartons to a shipping case.

Retailers "go" for the sticks because they meet their need for rapid-turnover items that can be self-serviced in freezer-type display cases.

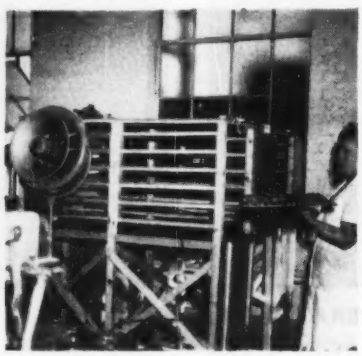
Development of the fish sticks is credited to Birds Eye Div. of General Foods Corp., which introduced them a little over a year ago after three years' experimentation.

Actually, production of standardized-package portions of fish is not new. Back in 1930, Atlantic Coast Fisheries Co., of Boston, developed a machine that automatically formed, from fish fillets, steaks of uniform size and thickness (*Food Industries*, Dec. 1930).

In this case, fillets were placed horizontally and overlapping in a cylindrical, open trough that carried them through a die. Parchment tape was then machine-wrapped around the gently compressed fillets. Water sprayed on the parchment-covered fillets held them together until steaks,

(*Turn to page 202*)

4 **BREADED** sticks are fried 2½ min. in 375-deg.-F. shortening.



5 **FRIED** sticks are cooled 5 min. in company-built cabinet cooler.

6 **COOLED** sticks are packaged 10 to a carton and frozen.

APPEALING products are made from prepared rinds, which vary from 10 to 15% of total weight of watermelons.

They've Smoothed the Rough Path to

Melon-Rind Items

Unwanted parts of fruit can be "machined away" . . . Advances in firming, freshing, boiling . . . Variety selection, storage methods simplified . . . Details on making jam, conserve, preserve, pickles, relish, spiced and glace rinds

W. E. DUPREE, J. G. WOODROOF and SARA SIEWERT
Georgia Experiment Station, Experiment, Ga.

Since a number of excellent products can be made from watermelon rinds, a most inviting field appears open here for commercial enterprise.

But . . . several scratchy factors have plagued venturing processors: There's been a lack of rind uniformity, inconsistency of rind quality, undependable and time-taking processing methods, high preparation costs, expensive manual labor, trip-ups through selection of unsuitable varieties, and devious troublesome aspects on the score of storage.

Meanwhile, it's noted that a great number of available watermelons are not being utilized. For example, 60% of the melons produced in 1950 by 274 Georgia growers went unharvested, and 50% of those grown in '51 by 144 planters.

So raw materials being plentiful, the big question has revolved around streamlining of the processing methods. This problem has now been attacked by Georgia Experiment Station, which launched investigations to—

►1. Devise a method of reducing the cost of preparing watermelon rinds, with particular attention to mechanizing of major operations.

►2. Cut down on the firming, freshening, and cooking times by adopting better methods of controlling temperatures during these operations.

►3. Develop more formulas for the preparation of a variety of products from rinds.

►4. Determine melon varieties most suitable for processing.

►5. Adapt one or more methods for storing melons or rinds to be used later on for processing.

On 20 watermelon varieties, suitability of rinds for processing was evaluated. Preference was given those that were thickest, had the most white tissue, and were tender, crisp, and free of tough fibers or woody areas. For hand peeling and cutting, round

watermelons were as suitable as the long ones. But long ones were favored on machine operations.

Medium to small melons (20 to 25 lb.) were most economical for processing, since the price per pound was less than for larger ones, and the yield of prepared rinds was slightly higher.

Varieties rated as very good included: Garrison, Tom Watson, Stone Mountain, Pride of Georgia, Thurmond Grey, and Missouri Queen. Most of them have relatively thick rinds, which are tender (as indicated by an optimum shear-test pressure of 2,300-3,200g.) and can be made into excellent products.

Those rated good were: Dixie Queen, Cole's Allhart, and Cannonball. They have medium thick rinds, but are of the round type and yield only a moderate amount of prepared rinds. Preserves and pickles made from these rinds are very good, except for some objection to the soft texture of Dixie Queen. Jones and other little-known varieties reportedly have made excellent pickles and preserves.

Winona, Watson's Black Diamond, Black Diamond, Congo, and 51-9 were rated fair. With the exception of 51-9, they have thick rinds and yield a high percentage of prepared product. However, the products are hard, fibrous, or woody.

Rated poor were Tennessee Black, 48-12, Brownlee, 51-27, Hawkesbury, and 51-23W. Except for Tennessee Black and Brownlee, these varieties have very thin rinds and yield a small amount of prepared product. Preserves made from them were tough, fibrous, and woody.

Rinds from the citron type of melon were not suitable. Although the white and attractively prepared rinds were about 40% of the weight of these melons, they could not be properly firmed. The rinds collapsed upon cooking, and preserves or pickles made from them shrunk and become tough.

Yield of prepared rinds varied from 10.1 to 15.4% of the weight of melons. Rinds from some varieties required much thicker peeling to remove the green portion, but there was no relation between thickness of this green area and tenderness of the white portion.

After the pink area was removed, thickness of rinds varied from .48 to .74 in. Firmness of prepared rinds (grams required to shear with a shear-testing apparatus) varied from 2,200 to 5,100, with 2,400 being optimum. This is a fairly true index of rind toughness. However, it does not accurately measure fibers or woodiness.

Rinds from all varieties are suitable for jam, relish, or conserve. Those from most varieties are satisfactory for preserves, while fewer were desirable for pickles or glace fruit.

Preparing the Rinds

Peeling and shaping operations involve removing peel to a depth of $\frac{1}{8}$ to $\frac{1}{4}$ in. (depending upon variety, size, and smoothness of the melon); taking out the soft red portion; and cutting the rinds into strips, squares, circles, dicing or the like.

These were the methods tried out:

1. Hand peeling and trimming, which usually results in the highest yield. Although time consuming, it is the only feasible method of preparing rinds where less than 50 lb. of product are needed.

With care, approximately 5 lb. of prepared rinds are obtained from a 25-lb. melon of the Stone Mountain or Cannonball variety. And one person prepares approximately 10 lb. of rinds an hour.

In a commercial plant, seven workers hand-peeled and shaped 80 lb. of rinds an hour, with an approximate $3\frac{1}{2}$-lb. yield of edible rinds from each 25 lb. of melon.

Fairly satisfactory results were obtained by peeling whole melons with a large knife, equipped with a curved blade and a guard to prevent cutting too deeply. Trouble in peeling whole melons is that they can't be held for rotating for uniform peeling on all sides.

2. Peeling whole watermelons with lye gives poor results. Unless the melons are smooth and their rinds uniformly thick, this method is faulty from the start. Most satisfactory method of lye peeling involves immersing melons in a 10% lye solution and heating to 145 deg. F., with continuous agitation, and giving a time of 5 to 7 min. The peel softens and then can be removed under tap water sprays with brushes. Objection to this method is uneven peeling.

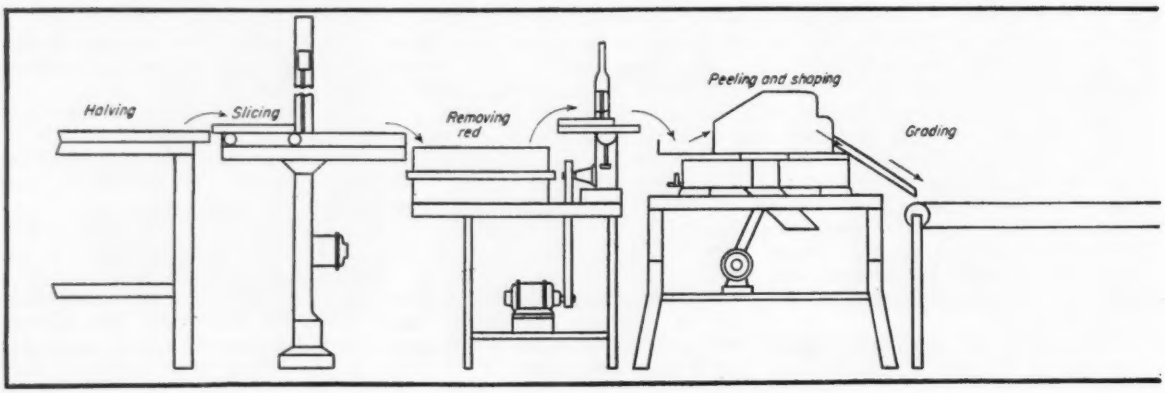
3. Mechanical peeling and shaping of rinds is the most satisfactory for handling large quantities, from a viewpoint of saving both labor and time.

In this method, melons are cut into about eight longitudinal slices, and most of the red meat is removed with one stroke of a knife. Sections are then firmly pressed, by hand, against a rotating, stainless steel buffing brush (6 in. dia.), thus gradually moving the rind in a direction opposite to the rotation of the brush. The brush is assembled on a shaft and mounted on pillar blocks. It is driven at about 1,700 rpm. by a $\frac{1}{4}$-hp. electric motor.

Brush bristles bite into the tissue and remove the outside green peel. And with another stroke, the remaining red meat is removed. Although the green peel is removed with difficulty and the surface has a fuzzy appearance (due to fine lacerations of the tissue), this device rapidly and

Step-by-Step on Rinds From

Process for making rind products. Red, meaty portion is scooped from halved, and then sliced melons.



uniformly removes the remaining red portion from the rinds.

4. Watermelon rinds can be peeled satisfactorily on a wood planer, although the procedure is slow and hazardous. An improved planer, built with a mechanized arrangement for feeding the rinds, is more efficient than the conventional wooden one.

This machine was built in 1951 by the Engineering Experiment Station at Georgia Institute of Technology. A custom-made feeding and cutting device is attached on a standard model wood joiner (planer). It peels sectioned rinds and cuts them into small, uniform pieces in one operation.

5. For more complete mechanization of cutting, peeling, and shaping, other devices were added, improving the peeler-shaper. A power-driven band saw now cuts melons into 2-in. cross sections, and a jig saw removes the red portion.

This portable unit was used on a production line that handled, during two seasons, 45,442 lb. of melons. Five or six workers ran the machine, which handled 40 to 50 melons per hour. Data showed that the man-hours required by the mechanical method was about half the number demanded in the hand preparation.

Yield of prepared rinds is about 0.5% higher with the mechanical unit than by manual methods. By using the rotary brush for removing the red meat—instead of the jig saw—yield was increased more than 2%.

Firming the Rinds

Rinds must be firmed after they are cut to the desired shape, in order to produce the desired crispness in finished products. Otherwise, they become spongy and soggy, and sometimes leathery.

PEELER-SHAPER is demonstrated by Author Woodroof. Motor-driven planer simultaneously peels off green, cuts rinds to desired shape.

Firming is best accomplished by soaking rinds in a calcium salt solution. Most satisfactory results were obtained with solutions kept at 50 to 70 deg. F., especially for overnight firming.

Rinds treated 4 hr. in a 0.4% calcium hydroxide solution (75 F.) proved excellent and superior in texture to those treated for only 30 min. And they have better texture than those similarly treated at 110 and 145 F.

Covering rinds with firming solution and subjecting them to a 28-in. vacuum for 10 min. proved unsatisfactory. Even though the rinds rapidly absorbed the firming solution, they were soft and lacking in crispness in the final products.

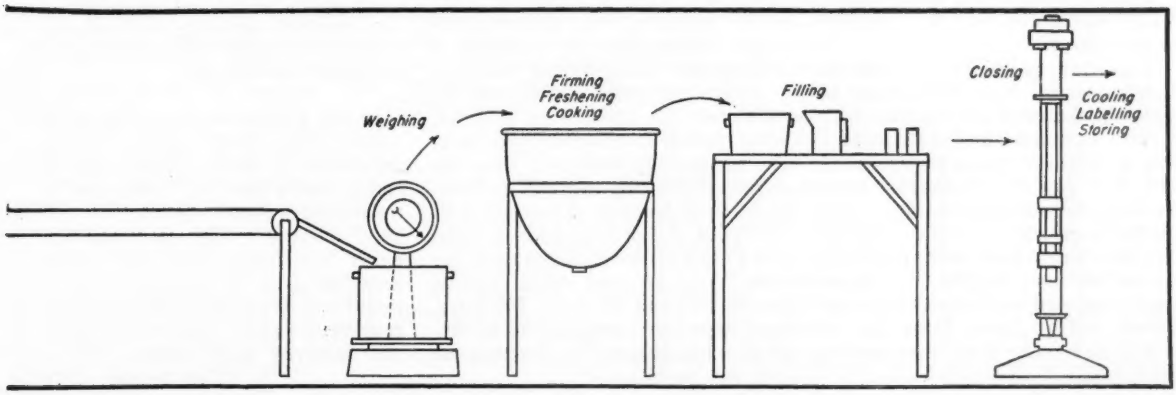
Satisfactory firming can be achieved by adding approximately 2 parts water and 1 part rinds (by weight) in a kettle, with either 0.1% calcium hydroxide solution for 15 hr., 0.2% calcium hydroxide for 4 hr., or 0.4% calcium hydroxide for 2 hr.

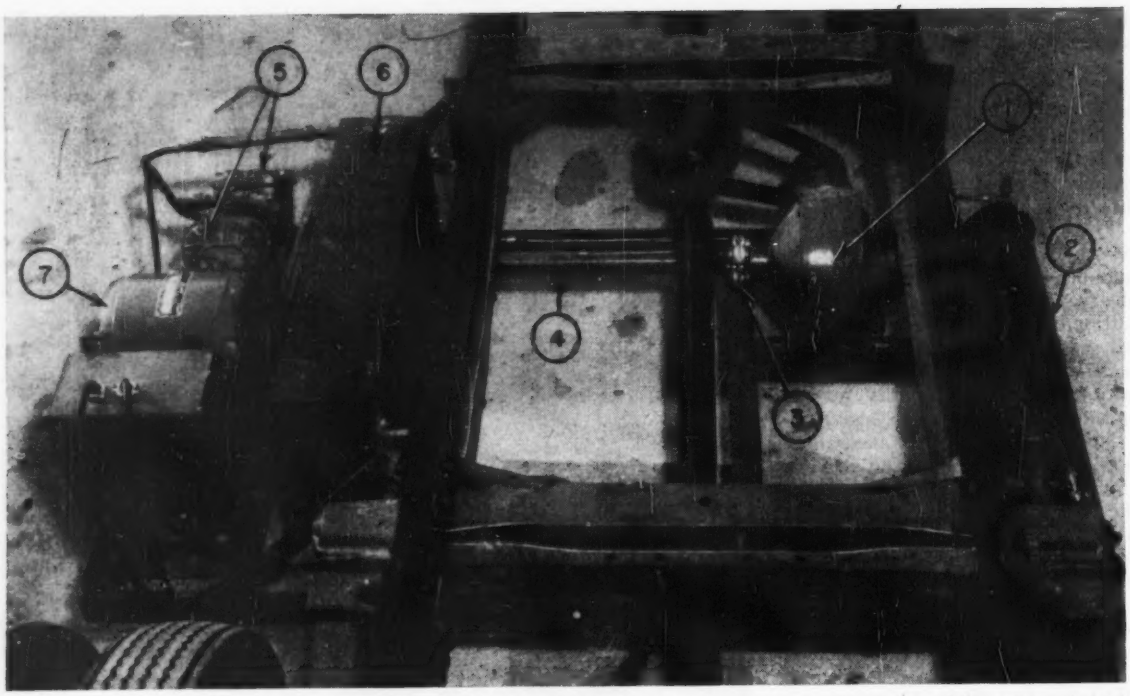
After firming, excess calcium hydroxide is removed from the rinds by washing and soaking. This can be accomplished by draining the calcium solution from the kettle and replacing it with fresh water three times at

(Turn to page 179)

the Fruit to Product Storage

Rinds are then prepared by peeling, shaping, firming, freshening, and parboiling.





CLOSEUP of installation on a truck chassis, looking toward front. (1)—New clutch unit, pulley driven from truck's shaft. (2)—Clutch oil reservoir. (3)—Universal joint. (4)—Driven shaft to run compressor. (5)—Refrigerating compressor. (6)—Refrigerating condenser. (7)—Plug-in electric motor for use when truck is parked.

Solenoid-Controlled Clutch Gives Top Performance In Taking—

Refrigerating Power *From Truck Engine*

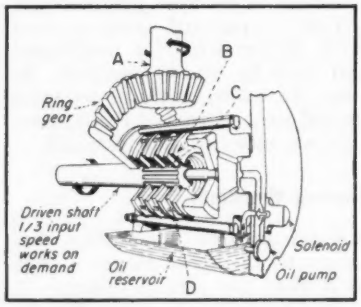
BY USING your truck engine to run your truck-refrigeration system, need for separate power in keeping foods conditioned is eliminated—winning the prime benefits of lower first cost of equipment and reduced running and maintenance expenses.

But—a number of factors have tended to subtract from the efficiency of such systems.

This situation has led to several efforts to resolve the problems and so boost the dual-work performance. And notable success is now reported in a new approach featuring solenoid control of a patented hydraulic clutch working in conjunction with cold plates or cold-blower units. Already the new units have been employed successfully on specific ice cream trucks operated by Borden's, Beatrice Foods, and St. Louis Dairy Co., as well as on vehicles of the meat packer, Swift & Co.

Basic in the one-engine attempts is the logic that the average truck's engine has enough reserve horsepower to "take the load" of the refrigerating equipment without material effect on the truck's operating efficiency.

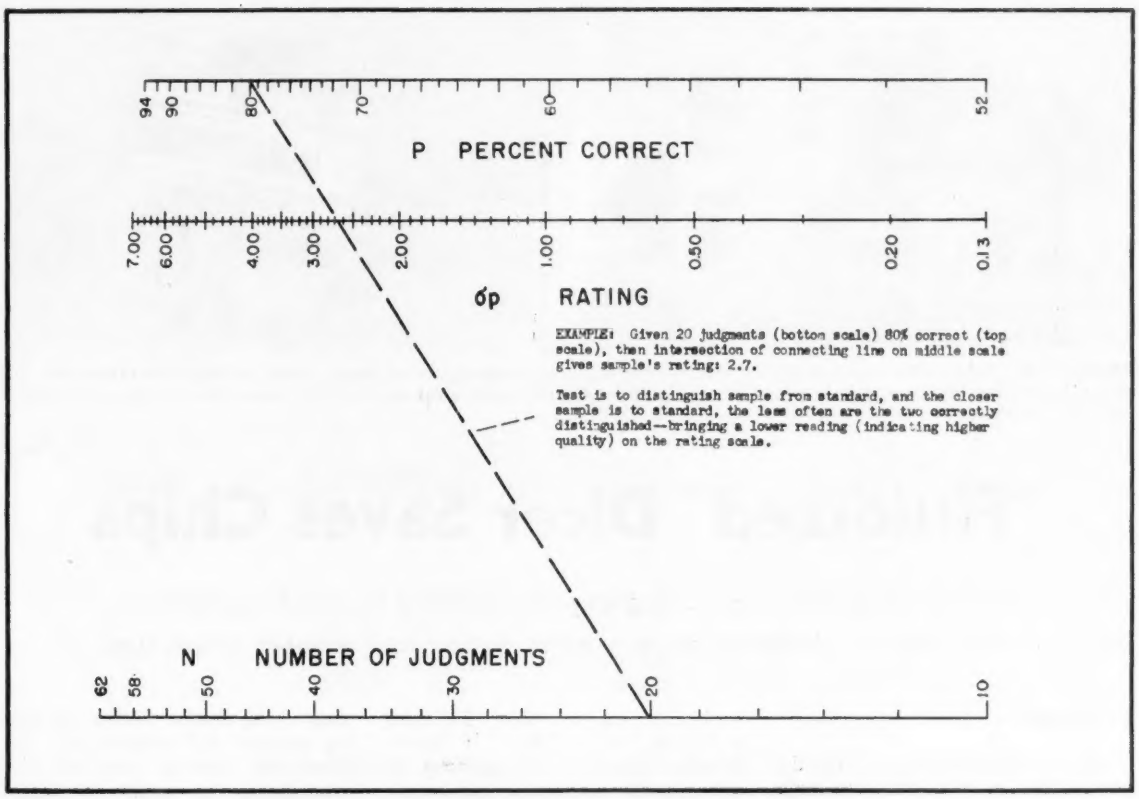
However, previous setups have involved operating problems not primarily concerned with engine horsepower. Among these are: Difficulty in shifting gears when starting the truck or in making speed changes on the road while the refrigerating load was being carried; shocks developed under the refrigerating load each time the driving clutch was engaged or disengaged; and troubles concerned with the speed of the compressor in relation to that of the truck engine as the latter turns up road speeds varying between 10 and 50 mph. Moreover, there have been complications in electrical relays designed to overcome the different problems.



HOW it operates: (A)—Driving shaft powered from truck engine through a power take-off, propeller shaft, or live axle. (B)—Four steel driving plates connect to ring gear and turn with driving shaft. (C)—Three bronze driven plates connect by splines to driven shaft. They rotate only when oil pressure on end piston forces contact between driving and driven plates. (D)—Springs instantly free driving from driven plates when oil pressure is released by solenoid.

In the Kold-Trux system, made by Tranter Mfg., Inc., Lansing, Mich., difficulties in shifting gears and in clutch shocks have been overcome by a patented hydraulic clutch (see cutaway drawing). This unit may be either belt driven from the truck's propeller shaft, or operated from a power take-off on the gearbox or transmission, wherein a small spur gear on the belt-drive shaft meshes with a

(Turn to page 203)



This Chart Quickly Answers the Key Questions—

Accept the Batch? . . . *Or Reject It?*

OM. P. KHARBANDA

Department of Chemical Engineering,
Polytechnic Institute of Brooklyn, N. Y.

In quality-control testing of foods on the score of uniformity, use of this nomograph will prove a big aid.

A low numerical rating on the chart's middle scale will indicate that your batch of food under test is close to the standard and hence is acceptable. In this instance, the standard error of a percentage—designated σp—decreases as the percentage of judgments in error increases. Obviously, the more times the judges mistake the test sample for the standard, the nearer the sample is to the standard, and therefore the more acceptable.

How the chart is used is indicated by the scribed example (see chart).

For the purpose in question, it is general practice to call an acceptable batch or product "standard" and then compare succeeding batches with it for color, odor, taste, and any other pertinent criteria. Such testing can be done by a quality control panel composed of regular employees who over a period have proved good judges.

Each member of the panel is asked to acquaint himself with the standard sample. Then, he is given the standard sample and the test sample (from the current production batch) in an unknown order. His judgment in identifying which is the unknown sample and which is the standard is recorded simply as correct or incorrect. The test on sample and standard is performed twice. Thus, if there are ten members on the panel, a total of 20 judgments is obtained for a particular batch and, one at a time, for the criteria—color, odor, taste, etc. The results of the test can be analyzed by the procedure suggested by Peryam*. Briefly, it consists of figuring σp rating as follows:

1. Calculate σp—

$$\sigma p = \sqrt{\frac{PQ}{N}} \quad \text{Equation (1)}$$

where N = Total number of judgments; P = Percent correct; Q = Percent incorrect.

The true mean must be 50%—i.e., P = Q = 50

Therefore, $$\sigma p = \frac{50}{\sqrt{N}} \quad \text{Equation (2)}$$

2. Calculate σp rating or the standard error distance from 50%—

$$\sigma p \text{ rating} = \frac{P - 50}{Gp} \quad \text{Equation (3)}$$

where P is the percent of the correct judgments in an actual case.

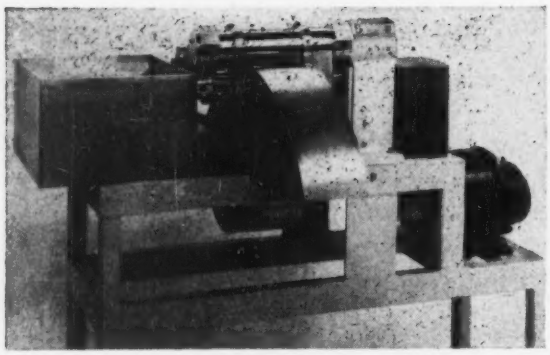
Combining equations (2) and (3):

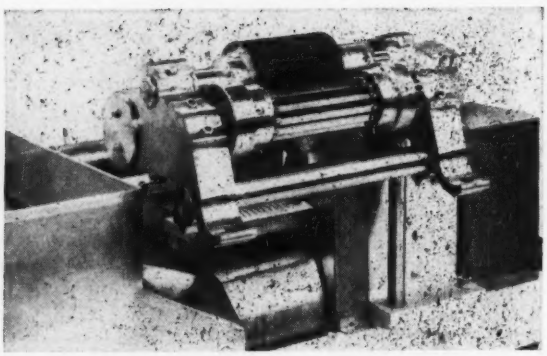
$$\sigma p \text{ rating} = \frac{P - 50}{\frac{50}{\sqrt{N}}} \quad \text{Equation (4)}$$

Equation 4 can be readily solved by use of the accompanying nomograph—connecting N with P with a straightedge and reading σp rating (see example on chart).

As stated, a low σp rating indicates acceptability. The exact rejection point will depend on the particular product and the criteria used for testing. For instance, Peryam points out that a workable rejection point employed for blended whisky is a σp rating of 2.2. And so, any batch testing below this point receives approval, while any rating at this point or higher is rejected.

* Peryam, D. R., *Industrial Quality Control*, Nov. 1950, p. 17-21.





ASSEMBLED MACHINE (left) is 59 in. long, 37 in. wide, stands 44½ in. off floor. Note sanitary steel-tube legs and snap-on stainless shields and hoppers. Cutter assembly (right) is shown thrown back for inspection and cleaning, revealing strip cutting and circular-blade cubing knives.

"Fluidized" Dicer Saves Chips

Innovation in root-crop cutting employs whirling feed and simultaneous knife action. Achieves more perfect cubing and greater production

FE STAFF

As many a home carpenter has discovered the hard way, whenever material is sliced with a knife edge, certain strains are set up transverse to the direction of cut. And what often results are some marring cracks or chips in the finished product.

This universal problem is particularly acute in slicing and cubing root vegetables for canning, where losses can zoom as high as 25% of the product run.

True, recent developments in mechanized transverse cutting–plus finer honing and induction hardening of knife edges–have greatly trimmed these losses. But trying to realize the productive potential of these improved assemblies requires even greater forced-feeding of product against the knives. Hence chip losses by impact also add to the toll.

In answer to this problem, a basically new approach to root crop dicing was tried this past season at the Larsen Co. plant in Green Bay, Wis. Developed by Urschel Laboratories, the new machine essentially achieves a "fluid" feed to its knives and simultaneous transverse-longitudinal cutting. And its premier performance on blanched carrots backed up optimistic expectations by–

- **Reducing average chip losses from 11.37 to 7.95%.**
- **Upping production rate an estimated 30%.**
- **Minimizing clogging and downtime by inherent sanitary features.**

Actual tests in the Larsen plant were made in the fall of '53, using a regular Urschel Model B Dicer–familiar throughout the industry for dicing potatoes, carrots, and beets–as standard.

Tests Prove Performance

Approximately 1,000 tons of blanched carrots were run through the new unit in a period of 11 days, and results were compared with a parallel production run on the "B" machine. Size of the cube attained was ⅜ in., a conventional one for the dicing of root vegetables.

Throughout this 11-day period, carrots of various sizes were run in order to get an overall average of the difference in chip loss. It turned out that the "B" unit averaged a loss of 11.37%, whereas the new machine average chip loss was 7.95%.

In terms of product, this 3.42% improvement represented, of course, well over 30 tons of carrots being brought into the range of specifications.

It should be pointed out that, in making these tests, a chip was defined as any carrot piece less than one-half cube, and the percentage of chips was evaluated by weight.

While true-capacity improvements could not be judged in the Larsen runs, previous testing witnessed a new production rate of 9 tons of white potatoes per hour, as against a maximum 6 for the Model B. And it is believed that a similar ratio exists for carrots.

Key to the success of the new machine is its unique method of feeding material and simultaneous two-directional cutting principle–ideas basic enough to require the careful patent coverage which is now in progress.

Essentially, product to be cut is delivered through a hopper into the inside of a stationary chamber with a 14-in. diameter. Rotating impeller blades inside this chamber whirl the product at high speed, with centrifugal force concentrating it against the inside periphery.

A tapered opening in the moving-product chamber exposes the action of a stationary slicing knife, with shape of the taper determining slice thickness. As the steady stream of slices pass out of the chamber over this immobile knife, an external rotary knife assembly immediately imparts transverse cuts to produce square-cross-section strips. And the latter move at high velocity into a set of circular knives that cuts the strips into cubes. These then eject into the discharge spout.

It is believed that this new principle–where cross-cut knives sever the product transversely to slice movement and simultaneous to actual slicing–relieves normal strip cutting strain and completely eliminates breakage usual in conventional action.

Also, by the "fluidized" centrifugal whirling, rather than packed-pressure feed, it is believed that breakage losses by impact against the slicing knife are greatly reduced.

Other advantages have been built

(*Turn to page 190*)

Food Engineering's

CANNING SPECIAL

AND SHOW GUIDE

NEW AND IMPROVED METHODS AND OPERATIONS

High Frequency Looms as Improved Cooking Method 52

New Twist in High-Temp., Short-Time Retorting 54

Full-Flavor Concentrates by New Recovery Technique 55

From Orchard to Cannery—Under Water 58

At Gerber's, Quality Control Reigns Supreme 60

Bulk Brining Spells Big Benefits to Canner 73

Top-Notch Tomato Processing Operation 77

Dual Tomato Cannery—How It Ticks 86

CANNERS' SHOW GUIDE AND DIRECTORY

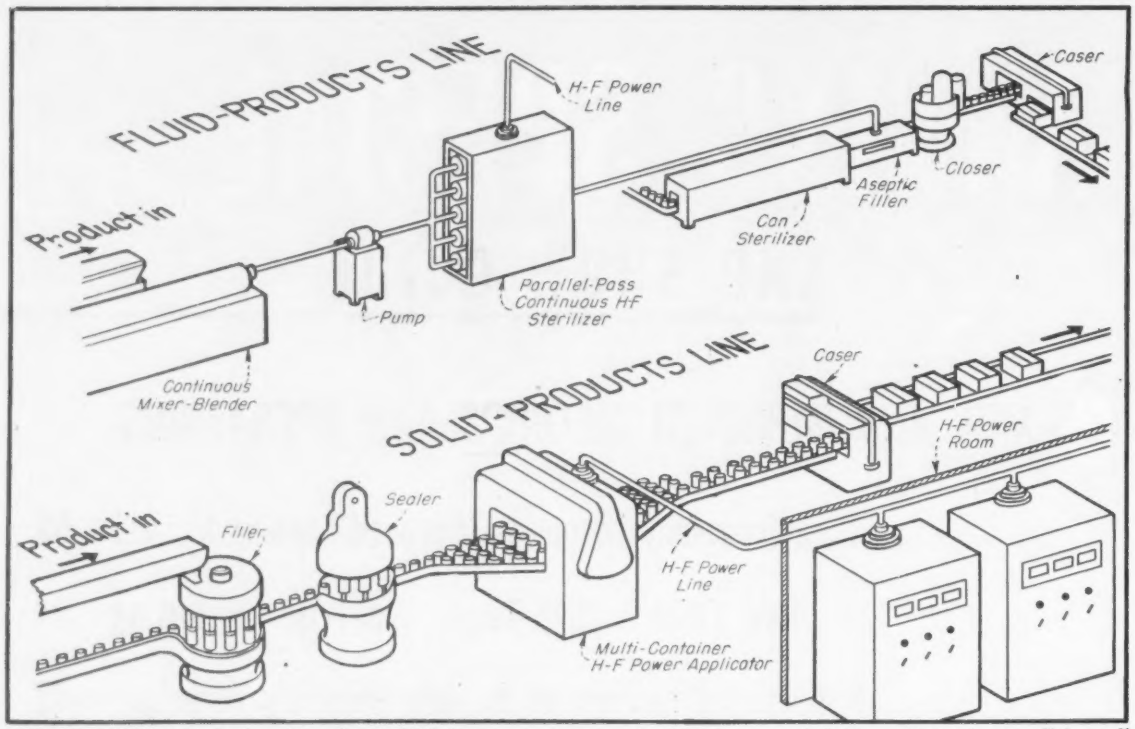
Floor Plan Showing Booth Locations 74

Handy List of Equipment Exhibitors 75

ADVANCED EQUIPMENT WILL BE EXHIBITED AT CONVENTION HALL, ATLANTIC CITY, JAN. 23-27

A Special Section of FOOD ENGINEERING, January, 1954

H-F Processing in Future Canning Lines?



HYPOTHETICAL in-plant set-up shows high-frequency energy sterilizing pumped fluid products in parallel applicator, followed by aseptic fill. Solid products might be processed inside special containers that also double as cells for applying voltage.

HIGH FREQUENCY LOOMS AS

"Di-Thermal" processing—new unit operation already experimentally

LLOYD E. SLATER
Associate Editor, "Food Engineering"
(Based on interviews with L. J. Pircon, Engineer, and D. M. Doty, Assistant Director, American Meat Institute Foundation, Chicago)

Steam-to-product heat transfer has been a "prime mover" in the advance of modern canning. And food engineers rightly look forward to many further gains through this type of thermal processing.

But one basic factor will always limit conventional heat-exchange—the need for heat to penetrate from outer to inner layers of food, with subsequent overcooked portions.

Ten years ago, when high-frequency dielectric heating appeared to revolutionize the bonding of plastics and wood, food researchers were agog. Here, they believed, was a new approach in solving that basic heat transfer poser—a means of energy transfer that would cause foods to heat fast and uniformly from center to surface.

A small flurry of experimental work gave somewhat disappointing results. Food could indeed be cooked rapidly by the method, but uniform heating was not attained. Also, the lack of suitable containers for this type of processing further stymied commercial development.

Today, however, there are strong signs that H-F techniques are on the verge of wide practical application in food processing.

Take recent findings at the American Meat Institute Foundation*, which point to—

- **More efficient processes tailored to each food's electrical make-up.**
- **Continuous in-pipe processing units ideally suited for aseptic canning.**
- **New container prototypes designed for practical "in-can" treatment.**

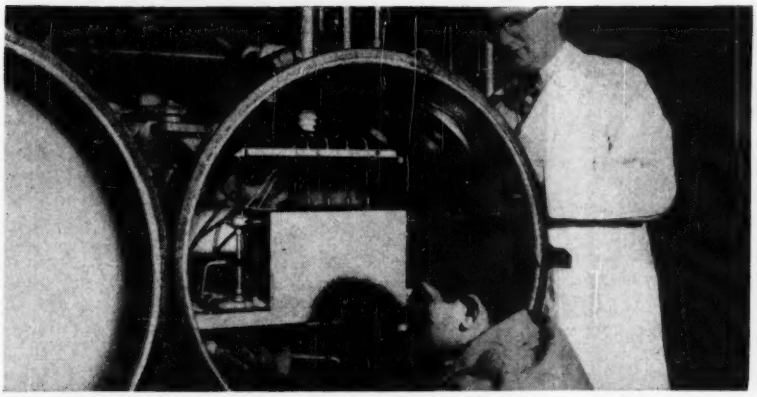
But before detailing these findings and their implications, a word about the theory of the new operation:

Dielectric heating—as employed in plywood and plastics bonding—is achieved by placing material between two metal electrodes, or plates, and applying a rapidly alternating high-voltage current. Product temperature develops uniformly and internally by frictional losses, as polar molecules try to align themselves with alternating potentials at the electrodes.

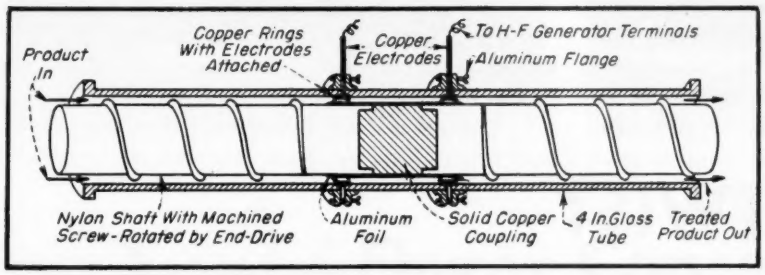
Since the above phenomenon was first observed and commercially perfected for non-conductive (or dielectric) materials, the equipment and know-how developed was very specific. To gain thermal energy, such nonconductors must be subjected to very high frequency and current in a shallow portion to minimize electrical

* Research projects in dielectric heating of meat products at A.M.I. Fdn. were sponsored by Q.M.C., Food & Container Institute, U. S. Dept. of Defense.

Today's Researches Point To It



EXPERIMENTAL processing cell was rigged with a series of thermocouples to follow heat developed inside product.



CONTINUOUS H-F applicator passes screw-urged fluid foods over a foil conductor and under two spaced electrodes. This was designed by American Meat Institute Foundation for experimental purposes.

H-F OSCILLATOR used in researches provides 15 kw., is prototype of larger power source for future in-plant use.

IMPROVED COOKING METHOD

proved on meats—may challenge steam in tomorrow's canning plant

capacitive reactance. Hence, powerful circuits and large-area, narrow-gap plate processing cells evolved.

Food researchers, in attempting to use this equipment on their products, encountered some serious difficulties.

Food Is Different

It was quickly discovered, when A.M.I.F. researchers first approached the problem, that food could not be treated like plywood. For in measuring electrical properties of seasoned and cured meats, these materials acted more like conducting ionic solutions than non-conductors or dielectrics.

Then, with electrical values (specific qualities of resistance, capacitance, and reactance) first established for each item, they were able to proceed with the design of an appropriate "tailored" product-treating cell.

Since reactance was found to be negligible in these foods, their ideal working set-up turned out to be almost the opposite of that used in processing dielectrics such as plywood and plastics. In this case, geometric cell design now involved small electrodes, which were widely spaced, with an inherent saving in power.

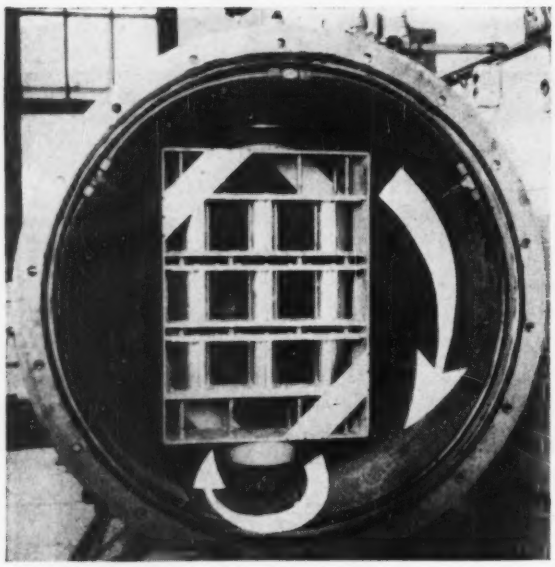
As a matter of fact, the enlightening results obtained in initial studies with this "tailored" equipment convinced these workers that they were involved with a distinctly new and unique technique. (*Turn to page* 148)

Other Applications

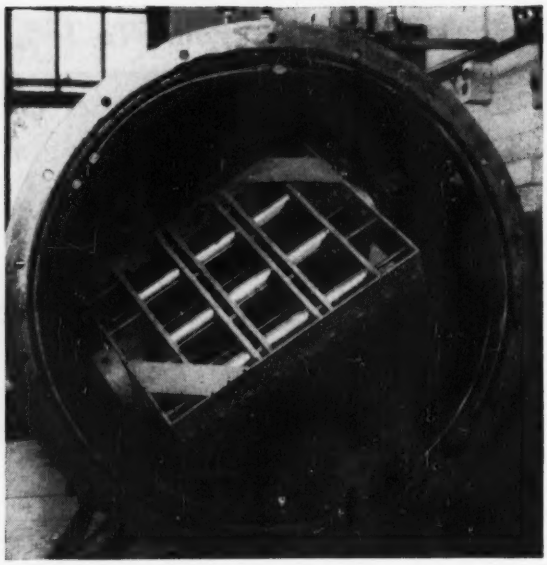
Aside from this promising work in meat cooking, many other interesting possibilities for H-F exist in the food field.

Defrosting of frozen foods is already a commercial venture. H-F energy is used to thaw and heat pre-cooked frozen dinners. Instance: One railroad recently installed "ranges" of this type on its diners. Thawing of frozen hog bellies for further processing—another original A.M.I.F. research project—is under experiment by several meat packers.

Fact is that this unique way of developing heat from within a product quickly, and with no surface deterioration, may yet become a widely used tool in such diverse operations as: (1) Chocolate melting; (2) fats and oils "fluidizing"; (3) de-infesting cereal products; (4) pasteurizing fluids such as beer, wine, and juices; (5) blanching products to inactivate enzymes; and (6) roasting nuts and beans, etc.



ROTATION of frame (arrows) is clockwise, in two directions, at varied speeds. Here frame is in loading position.



SPINNING ACTION added to end-over-end increases the headspace movement. No. 10 cans are in frame.

NEW TWIST In H-S Retorting

Novel agitating system adds horizontal to end-over-end can movement to shorten processing time

J. M. BORGES and N. W. DESROSIER

Agricultural Experiment Station, Purdue University, Lafayette, Ind.

By inducing turbulence in the can, agitation greatly speeds heat penetration. This speed up, however, can be fast or slow—all according to type and method of container movement.

Consider the in-can aspects of the so-called "end-over-end" action. First, the can involved is at least 90% full, but never completely. When this filled container is rotated at speeds so that its centrifugal force equals the force of gravity, a maximum turbulence is developed as its headspace void passes through its central zone.

It is obvious in this process that only two headspace passes occur per revolution. Also, that increasing the speed of rotation adds no benefits, in fact is harmful.

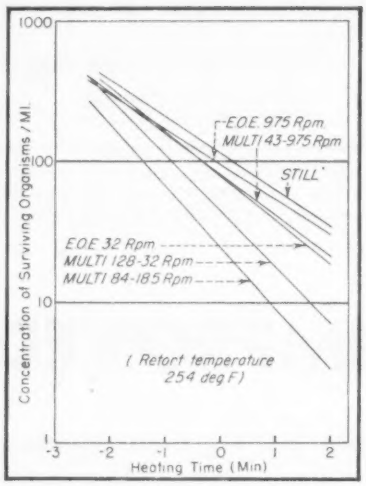
Our studies of can movement convinced us that it might be possible to remove this barrier to faster heat-penetration by imposing an additional force—perhaps a combination of horizontal and vertical rotations simultaneously.

Preliminary tests with an experimental cooker designed along such lines have convinced us that this new movement—which we call "Multi-Action"—definitely increases the number of turbulent headspace migrations and further improves heat penetration over systems presently available.

Essentially, this experimental cooker consists of a standard horizontal pressure retort shell with the addition of an enclosed shaft-borne yoke and can-bearing frame driven by an external motor.

The movement of yoke and frame in the shell is both a free spinning and rotating action.

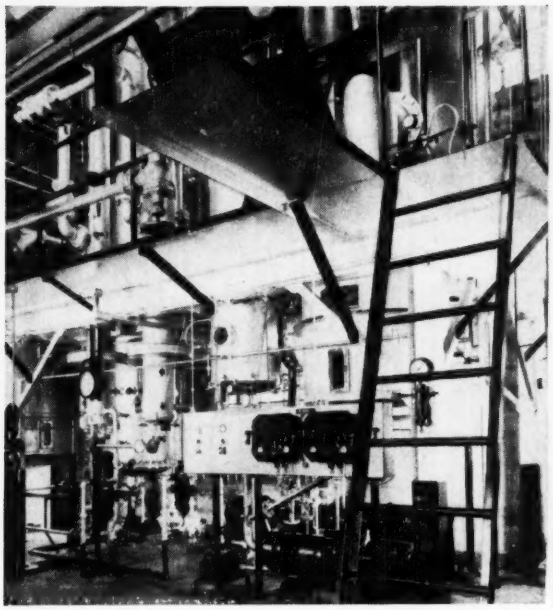
While the unit was initially designed to operate at speeds up to 250 rpm., in its present use an end-over-end speed of 32 rpm. and a spinning rotation of 128 rpm. are found to be adequate maxima. Rotation of the yoke is through a pulley mounted on the outer end of the main driveshaft. This is driven by a belt from an intermediate speed-reducing shaft, which in turn is powered by a ½-hp. motor having a worm-gear-reduced speed of 108 rpm. Actually, the outer end of this auxiliary driveshaft extends beyond the end of the main shaft and can be operated, through pulleys, at speeds varying with the main-shaft rotation, if desired.

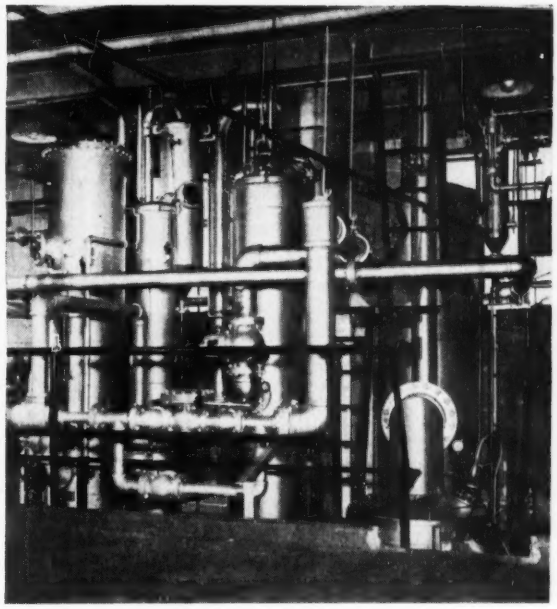


PROCESS-SPEEDING possibilities of new method are indicated in this graph showing influence of agitation on rate of destruction of P. A. 3679 spores in neutral PO_4 buffer solution in No. 2 cans. Negative time units indicate time to bring retort up to temperature.

Actual path of movement of a reference point in the rotating yoke can

(Turn to page 153)





EVAPORATING units (left photo) and recovery unit (right). In latter, aromatic essence is concentrated 150-fold.

F-u-l-l Flavor Concentrates

By New Essence-Recovery Technique

Hailed for its superior taste and true aroma, Keystone's grape juice is readied for freezing by economical method that bypasses old "cut-back" step . . . System is seen applicable to many other fruit and berry juices

JAMES G. MOORE

Product Engineer, Blaw-Knox Co., Buflovak Equipment Division, Buffalo

Phenomenal market acceptance of frozen orange juice immediately at its introduction created a strong and insistent demand for other juice concentrates, particularly those made from the juice of grapes.

Regardless of market willingness to absorb other non-citrus concentrates, the demand could not be fully satisfied until a new economical evaporative type of process developed and commercial equipment engineered to produce top quality concentrates with true natural flavor and odor.

Now, however, Keystone Cooperative Grape Assn., Northeast, Pa., is producing such a true flavor concentrate, employing equipment designed and built by Blaw-Knox Co., Buflovak Equipment Div., Buffalo.

► **Although the system was designed primarily to produce a full-flavored grape juice concentrate, the method is seen as having interesting potential for application to a variety of juices, such as cherry, apple, currant, strawberry, blackberry, huckleberry, youngberry, rhubarb, etc. Of course, each juice would require minor modification of equipment.**

Before successful processing, a number of technical difficulties had to be hurdled. Here is how major processing problems were solved:

Customary method of processing orange juice for freezing is to concentrate a portion to 50-60 deg. Brix. Much of the flavor and aroma (both of unstable ester origin) is lost during evaporation. However, in orange juice concentrating, flavor is partially restored by adding unprocessed "cut-back" juice to the concentrate to make a finished product of approximately 42 deg. Brix.

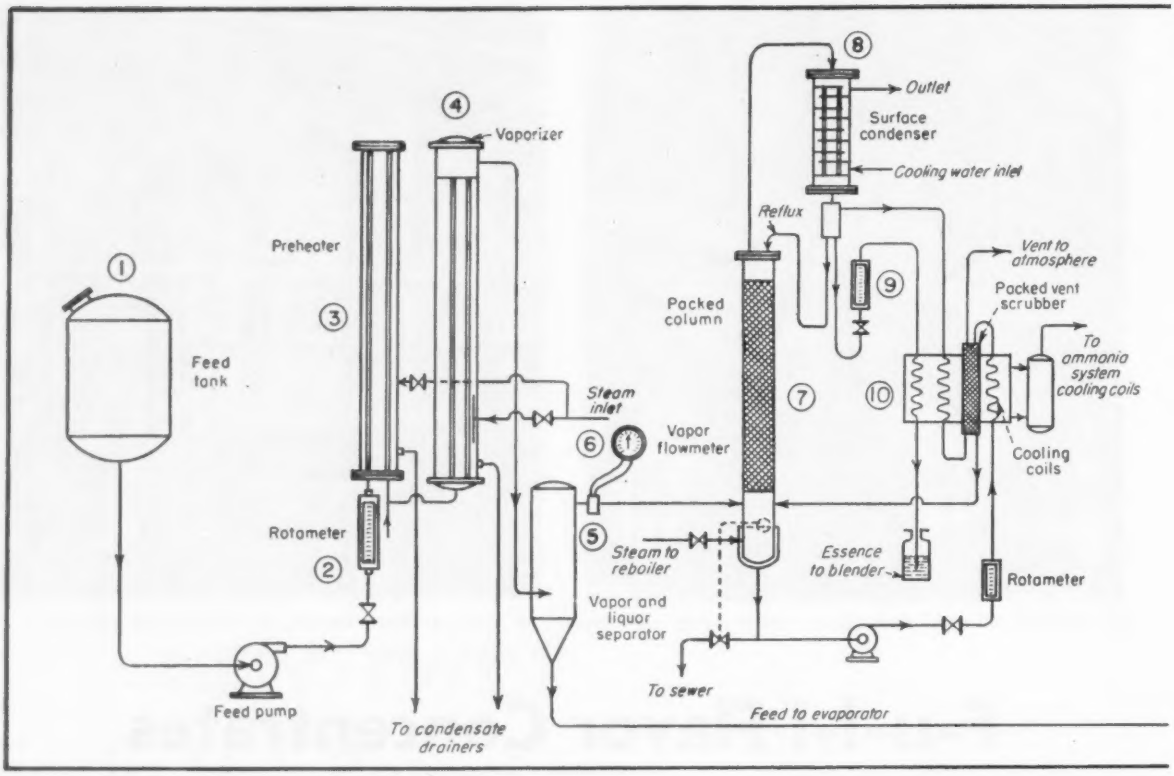
This procedure, when applied to concentrating grape juice, proved to be neither practical nor sufficiently economical for full scale operation.

In spite of substantial market demand for unsweetened non-depectinated grape concentrates, most juices could not be reduced below 48-50 deg. Brix without removal of pectin before evaporating.

Demand was also heavy for a sweetened and also depectinated juice made from Concord grapes. However, concentration required was 72.8 deg. Brix. To obtain this finished-product Brix, evaporation would have to be extended to produce a product of too high density, in order to absorb a raw juice "cut-back", to reincorporate the aromatics.

Then, too, partial restoration of aroma and flavor by adding raw juice to the concentrate proved to be unattractive from the viewpoints of added cost of fuel, water, equipment, and size and time. Obviously, the more the "cut-back" juice to be

Flow Diagram on Next Spread ⟶



FLOW DIAGRAM SHOWS

Raw juice is pumped from feed tank (1) at rate controlled by rotameter (2) into preheater (3), where temperature of juice is raised sufficiently to flash into vapor, in vaporizer (4), a fraction containing all aromatics and volatiles.

In centrifugal type separator (5) juice and essence-bearing vapor are separated, the former routed to the juice concentrating system, latter to essence concentrating equipment. Vapor flowmeter (6) provides gage for regulating steam to prevaporizer, thus regulating vapor volume. Vapor now enters 3-part fractionating column (7) with stripping rectifying and reboiling sections.

In surface condenser (8) aromatic-containing fraction is condensed and subcooled, a portion removed as 150-fold essence, and the remainder returned for refluxing to the top of the fractionating column. Essence concentration is determined by controlling essence draw-off rate indicated on rotameter (9), in relationship to juice feed rate.

Last 3-coil unit (10) in essence recovery system is

---

added, the greater the cost of the required concentration.

Sidestepping the cut-back method of restoring flavor was possible when a satisfactory economical method of essence reovery was developed by Eastern Regional Research Laboratory (USDA Bulletin AIC-63, 315, 342).

Essence Recovery

By this method, fragrant, volatile aromatics are first stripped from the raw juice. Essence fraction is then separately concentrated 100-150 fold and collected. Thus all flavor and aromatics can be returned to the juice after it is concentrated. However, juice need be concentrated only to that degree Brix required for the finished product.

Reincorporating the essence does not dilute the concentrate, since the aldehyde, ketone aromatic water solution added constitutes but a few tenths of a percent of the finished product.

Prepared in conventional manner with tartrates removed, raw juice of approximately 15 deg. Brix is pumped from a feed tank into a tubular-type preheater. Rate of flow is rotameter controlled. Four-pass vertical-tube type preheater moves juice at high velocity to reduce retention time to a minimum and also to assure turbulent flow. Localized overheating is thus prevented.

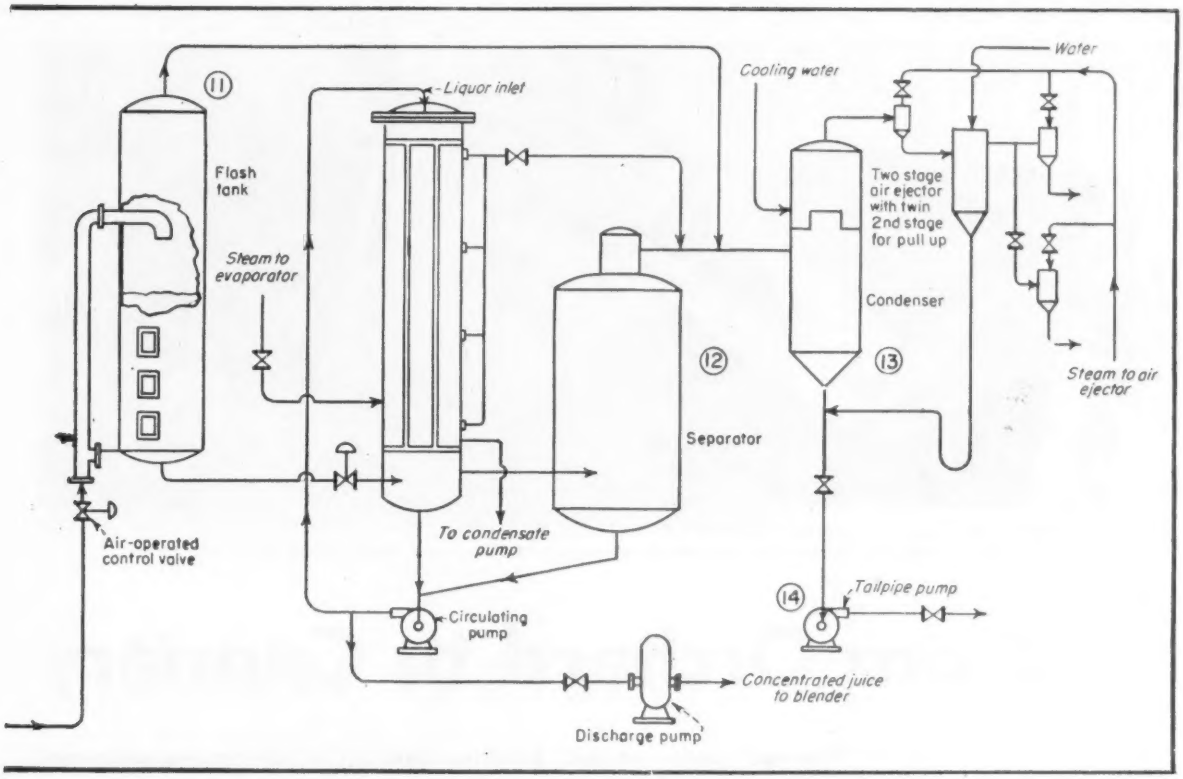
Heated juice is then delivered into the bottom of a vertical, single-pass vaporizer. Here, a predetermined percent by weight of feed is flashed into vapor, the amount being indicated by an orifice flange and indicator in the vapor pipe and controlled by adjusting steam pressure on the vaporizer shell.

Pre-heating and flashing operations –both at atmospheric pressure–are conducted in separate units to provide maximum control and thus prevent overheating of juice.

By employing only atmospheric pressure for the essence stripping operation, and also throughout the essence concentrating procedure, two advantages are gained: Processing costs are less than under reduced pressures, and no volatiles escape with vent gases. At reduced pressures, losses would be approximately inversely proportional to absolute pressure. Fortunately, flavor and aroma constituents are not affected by prolonged exposure to the temperature of boiling water at atmospheric pressure.

Essence Concentration

Leaving the vaporizer, juice and vapor enter a vapor-liquid separator



THE INSTRUMENTATION

ammonia refrigerated. Here, essence is cooled before removal from system, non-condensible vent gases are cooled before they are back-washed in scrubber, and "bottom" liquid is cooled before introduction to top of scrubber.

Juice from separator (5) is cooled in flash tank (11) —under relatively high vacuum aided by recirculation— to evaporator temperature. "Falling film"-type evaporator is designed for low operating volume and minimum juice-retention time. Evaporator level is instrument controlled.

From evaporator, vapor and concentrate discharge into a separator (12), vapor then entering barometric condenser (13) while concentrate is recirculated by pump (14) and a portion is withdrawn to finished product storage at desired density.

Overall control may be obtained by manually regulating steam pressures in accordance with rate of flow as registered on two flow meters, or by temperature and flow controllers installed for automatically varying the steam pressures or liquor flows to the different units.

---

of centrifugal type, which eliminates both foaming and entrainment. Stripped product is piped to flash and feed tank of juice concentrating units, while essence bearing vapors enter the lower section of a fractionating column.

This 3-compartment stainless-steel unit contains a rectifying section, stripping section, and (at its bottom) a tubular type re-boiler. Both rectifying and stripping sections are packed with vitrified, impervious ceramic Raschig rings.

Essence-bearing vapor that exits from the top of the fractioning column is condensed and sub-cooled in a vertical surface condenser in which vapor flows inside of tubes surrounded by cooling water baffled across the outside tube surface.

A built-in reflux distributor in lower section of condenser is arranged so that the portion not removed as concentrated essence is returned to the top of the fractionating column as reflux. Thus only about 1/35th of the condensate is withdrawn as 150-fold essence, which means 1/150th of the volume of the feed juice. When added to the concentrate made from the juice, essence represents a very small portion of the finished product.

By this procedure it is obvious that the strength of the essence is controlled by the relation between essence draw-off rate and juice feed rate once the system has come into equilibrium.

Final unit in essence recovery system is a liquid ammonia refrigerated cooler consisting of three separate stainless steel coils and a small scrubbing tower. Latter, packed with Raschig rings, acts as a vent trap to prevent volatiles from escaping with the non-condensibles. This is accomplished by back-washing vent gases with cooled "bottom" liquid from the fractionating column, then returning volatile-bearing liquid to the column for further stripping and re-rectifying.

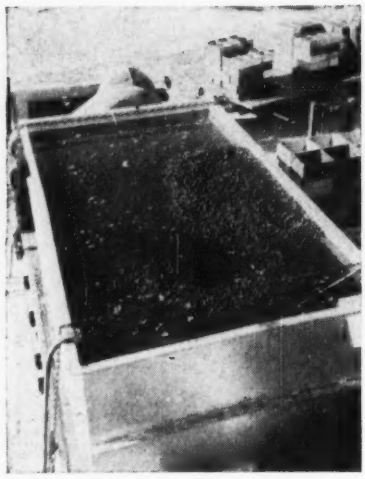
Cooling and Concentrating

Through one cooling-unit coil, finished concentrated essence is lowered in temperature as it is removed from the system. Through another, non-condensible vent gases are cooled before back-washing in the scrubber. Last coil is employed to reduce temperature of "bottom" liquid before diverting to the top of the scrubber.

From the vapor-liquid separator, where essence vapor is stripped from raw juice, remainder of latter is piped directly to a flash tank. Here, through evaporation under a relatively high vacuum, juice temperature is lowered

(Turn to page 148)

TANK-LOADED . . .



CARRIER TANK was filled by pouring cherries down oilcloth-lined chute. Spreader pipe in bottom supplied water. Used in '52, unit held 12,000 lb. of cherries in 4,000 lb. of water. Tanks were truck-hauled up to 250 miles.

From Orchard to Cannery

Tree-ripe quality retained, handling costs cut in bulk-moving submerged

J. H. LEVIN and H. P. GASTON

Respectively, Associate Agricultural Engineer, USDA, and Horticulturist, Michigan State College, East Lansing, Mich.

Michigan's canning cherry production is seen rising some 25% in the next five years. So it is obvious to packers in the area that they will have to put up a quality pack at minimum cost to profitably market this growing tonnage.

Perhaps the top target for improvement in conventional cherry handling is the method of moving fruit in lugs from orchard to the cannery. Tree temperatures of the fruit are high—75 to 90 deg. F.—and the readings sometimes go even higher in transit. Warm cherries are more subject to lug-scald, sunburn, softening, and bruising than are cooler cherries.

Further, lugs in the large numbers employed are costly and involve much manual handling. Lug handling is a difficult, expensive and time-consuming operation.

Hence, it's evident that the industry could use a new handling method that would reduce costs and at the same time to do a better job of preserving on-the-tree quality. Toward this end, a bulk tank for transporting cherries in water was developed. Three specific benefits are cited:

- **Vast reduction in time and expense of field handling**
- **Elimination of the need for, and maintenance of, "transit lug" boxes.**
- **Holding of tree-quality with lowered sorting costs**

Clue to the idea for the new system was provided by the standard cannery practice of promptly emersing incoming cherries in cold water to cool and "firm" their flesh. Why not move this quality-preserving technique right out into the orchard?

True, attempts had already been made to carry cherries in water from the orchard. But on study it appeared that their lack of success was not due to an unsound principle, but rather to faulty or impractical equipment and methods. Our work, then, was initiated with a careful study of the thermodynamics of tank cooling and construction of equipment designed for commercial field operation.

To remove the field heat from 1 ton of cherries by means of Michigan well water (at 54 deg. F.) requires that approximately 10 gal. per minute be pumped through the tank. Higher or lower water temperature, of course, means proportional changes in the pumping rates.

It was estimated that in a field receiving station where 30 tons of cherries were to be handled in a 6-hr. day, a water supply of about 50 gpm. would be necessary.

Looking Ahead

Not only the cherry but many other small fruits can be switched to this speedier, quality-keeping handling. Vegetables, too—peas already having been water-borne in milk-tank trucks. So it's reasonable to predict that this dollar-saving technique will be "leaving many more lugs by the wayside" tomorrow.

Equipment Developed

Three sheet metal (11 gage) tanks 4 ft. x 5 ft. x 7 ft. 8 in. were constructed and mounted on a standard 8 ft.-wide truck bed. Each tank has a capacity of 6,500 lb. of cherries and approximately 1,500 lb. of water, a sufficient amount to cushion the fruit during transit. This gave us a tank truck having a capacity of between 19,000 lb. and 20,000 lb. of cherries. Each tank had a 6 in. opening near its bottom provided with valves, making possible rapid emptying.

Proper water distribution in the tank posed a problem. For effective cooling as well as washing out of dirt, leaves, stems, and cherries having pulled pits, a perforated pipe was located near the bottom of the tank so that

. . . THEN "FLUMED" IN

AT CANNERY, fruit is flumed from the carrier into process tanks via 6-in. opening. Flow rate: 25,000 lb. of cherries per hour.

—Under Water

red tart cherries in 2-yr. Michigan field trials

water pumped through it would flow upward and carry debris over the top of the tank. We found that the tank should be sufficiently full when fruit is introduced to prevent bruising and assure almost immediate over-flow.

During the trials, the tank truck was filled at the cherry receiving stations. Tanks could be "spotted" at orchards of large growers where direct movement of the fruit from picking pail, over a sorting belt, and into the tank would eliminate all lug handling and speed fruit cooling. We plan to try this method of operation during the 1954 cherry harvest season.

At the cannery the fruit in our trial tank was "flumed" out through the 6-in. opening at the rate of approximately 25,000 lb. per hour. This system required approximately 40 gal. of water per minute for the fluming job.

Results Tabbed

During trials, over 400,000 lb. of red tart cherries were transported in water from commercial receiving stations to processing plants located from 25 to 250 miles distant.

In each case, check loads of approximately the same size were moved in lugs. Quality and temperature checks were made on all lots at the receiving station, during transit, and upon arrival. Also, quality and drained-weight checks of lugs- and water-transported cherries were made at various stages of processing.

Each lot included in the trials was graded according to Federal-State inspection standards at the receiving station and again on arrival at the processing plant. Data from these tests indicate that cherries can be successfully transported in this manner and that quality of these water-moved cherries on arrival at the plant, was always equal to, and frequently better than, lug-hauled lots.

A comparison of the losses incurred in sorting cherries moved in water and in lugs showed that there was almost always a significant difference in favor of the water method. Although this saving was not always large, it should be remembered that even small gains often become quite significant when applied to lots of several million pounds.

Transportation, Unloading Costs

When cherries are moved in lugs, the load is normally made up of fruit, lugs, and pallets. About 77% of the load weight is fruit, with lugs accounting for 17%; pallets remaining 6%.

On the basis of volume, lug-moved cherries comprise only 65% of the load, with the remaining 35% made up of lugs, head space, and pallets.

In comparison, when cherries are moved in water the load is made up of fruit, water, and tanks—with respective distribution of about 70, 20, and 8% by weight. The exact percentages depend on actual tank weight and water used. But if the units are properly designed and not overfilled, the figures given are substantially correct.

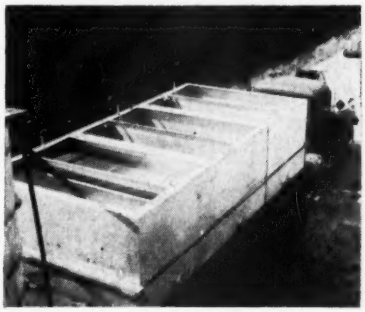
If tank weight is not taken into account in figuring charges (some truckers do not charge for lugs and pallets), 76% of the load would be made up by cherries and the remainder water. And on the basis of volume, the cherries moved in water occupy about 95% of the available space, since the water occupies space formerly taken by air.

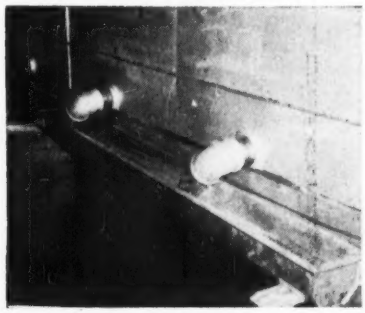
What the processor pays for transporting cherries depends, of course, upon the arrangement made by those who handle the movement. But an analysis of the figures above leads to the conclusion that using the new system will not materially alter trucking charges.

When cherries are moved in lugs and unloaded with lift trucks, a crew of seven men commonly is required for unloading, dumping, and reload-

(*Turn to page 153*)

For Bigger Volume





LATEST TESTS employ more compact tanks (left photo) riding three per truck and each holding 6,500 lb. of cherries and 1,500 lb. of water. Seen right is unloading of 10-ton fruit load at Michigan Fruit Canners plant, Fennville. It took less than 1 hr.

At Gerber's

Quality Control Reigns Supreme . . .

LLOYD E. SLATER
Associate Editor, "Food Engineering"

Volumes of words have portrayed the proper function of quality control in food manufacture. But while most processors agree with these ideals, few have "dedicated themselves" to carry them out.

Here, however, is a company that both regards and applies Quality Control with complete reverence – and then some.

At Gerber Products Co. the Quality Control concept is, of course, enhanced by the profound trust of supplying meals for our infant population. But it goes well beyond this. As President Dan Gerber puts it:

"Naturally, complete reliability and purity is a 'must' when making baby foods, and all-out management support of an unchallenged Quality Control group assures this. But we've also discovered that many added values in terms of product, progress, and profit seem somehow to materialize as this unrestricted philosophy is applied."

Hence, in order to do justice in a report on Gerber Quality Control we should consider this "unrestricted philosophy"–the use of "QC" in every phase of operations, from seed-selection to store-shelfing–as well as the organization and methods of the actual control group.

To begin with, then, let us briefly spotlight the Quality Control staff to help clarify its subsequent role in the seed-to-shelf story.

Perhaps the most striking aspects of this group are its size and versatility. Wearing the white "QC" cap are specialists in chemistry, bacteriology, process control, sanitation, statistical analysis–30 in all at the Fremont, Mich., plant, not counting secretarial help.

Groups for Service

Ray Wakefield, company technical director, heads up and coordinates the efforts of both Research and Quality Control. However, each plant–Rochester, Fremont, and Oakland–has its own Quality Control manager who is distinctly responsible for planned application of "QC" in his own domain.

Activities in the department are subdivided into four groups, each with its own chief–Inspection, Laboratory, Production, and Sanitation. Appropriately, these groups are called "services," since their function stresses the "consult and help" theme, rather than "nag and enforce."

Basic Monitoring

Inspection's job, of course, is the all-important day-to-day monitoring for controlling process standards. Its prime functions are to check raw materials, foods in process, and containers in movement through the plant.

Included in Inspection are a container inspector and a technician spending full time evaluating incoming materials.

Also in this group is a team of 9-10 girls that works at the lines on process inspection. The specially trained, hard working young ladies are stationed at preparation belts, at fillers, and at the end of the cooling canal.

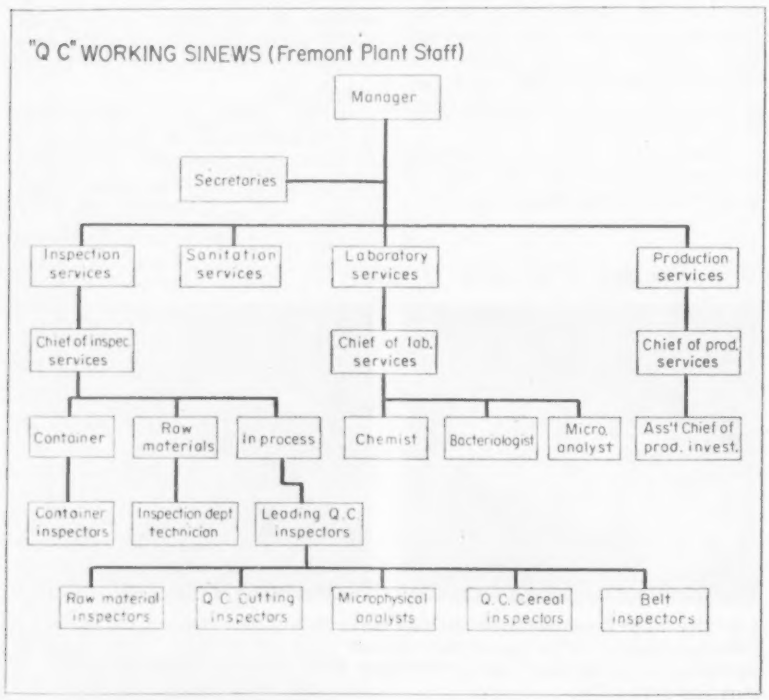
Laboratory Service is concerned with microbiological, chemical, and physical rating of both ingredients and finished product. Employing advanced analytical equipment, this group includes a chemist, bacteriologist, and microanalyst.

A trained sanitarian also operates in "QC." He works very closely with Laboratory Service personnel in evaluating equipment and processes and improving cleaning routine.

Also, the sanitarian plans the activities of an 18-man crew which, under a foreman, completely goes over the plant from 9:30 P.M. after shutdown until morning. And often he's there on the job during the wee hours.

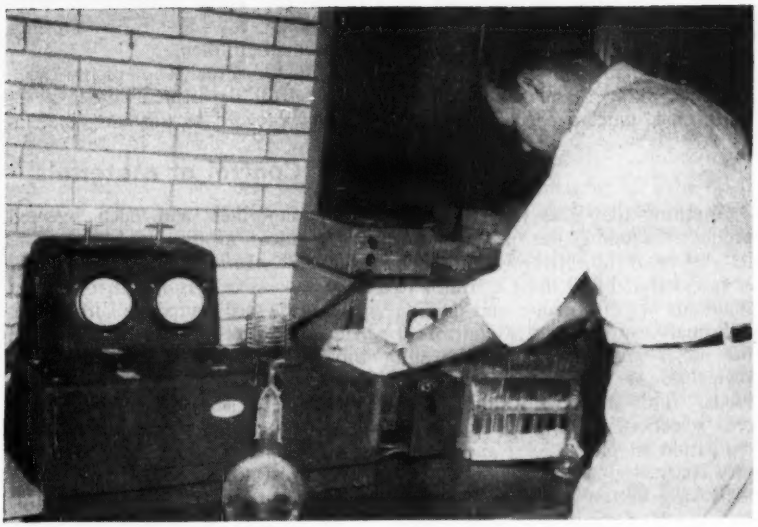
Most unusual in function is the Production Service. This group is headed up by a food technologist who, with an assistant, spends much of his time out at process helping to establish new methods, also trouble-shooting.

Production Service prepares the working formulas–initially developed by Research–and lines up needed unit operations and equipment for each



. . . In Materials

—where anything entering the plant for product, from a truckload of tomatoes to a sack of seasoning, must strictly pass muster on quality. And standards, plus the tests, are constantly being sharpened. Photo right: This spectrophotometer with flame attachment finds daily use by Lab Service chemist, Bob Nuelph, in tabbing pesticidal residue on incoming fruit. Reflectance attachment is employed for color tests.

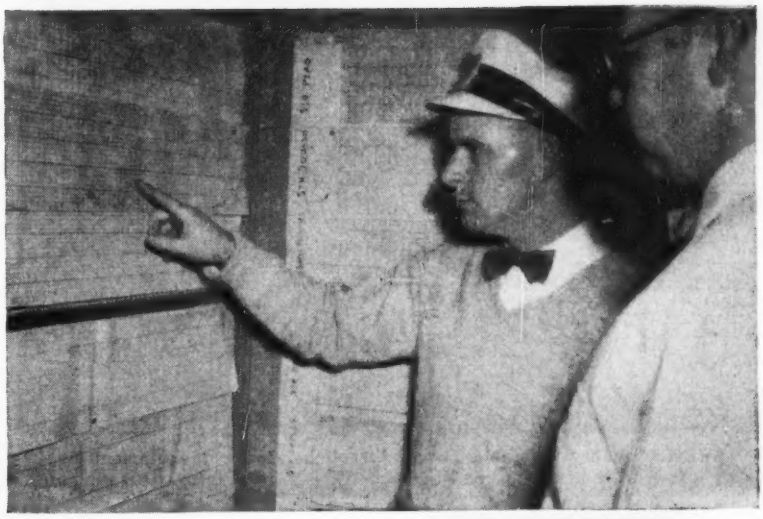


. . . In Process

—where full-time "QC" inspectors are posted by the lines to assure optimum trimming, filling, sterilization. Photo: A word from young lady who watches apple paring operations will cause the line foreman to post more trimmers or intensify rejection of cull fruit. Similar inspectors work with filling line and cook-room foremen. Also, a "QC" sanitarian roams the plant swab-testing to check populating microflora.

. . . In Product

—where a constant routine of test cuttings, incubation, and analyses determines day-to-day adherence to ever-narrowing standards. Photo: As Production Service Chief Lou Beem indicates to co-worker Howard Hays, consistency is a primary quality charted statistically for all items. Hence, gradual deviations due to ingredients, line changes, or raw produce can be quickly spotted and corrected before becoming significant.



process. All technical personnel in Research and "QC" work through this group in applying their latest means and materials.

Hence, Production Service represents that much-needed liaison between the astral thinking of technicians and the more earthy musings of production men.

With the actual scope of the Quality Control department defined, let us now proceed to the complete, integrated Gerber operation and spot "QC" functions as we go along. For simplicity, we'll divide the overall story into three sections: I. Control of Materials; II. Control In-Process; and III. Control of Product.

I. Control of Materials

Anything that goes into the final product—including the package and its carton—is objectively approached as raw material and must conform to standards of performance and quality.

Primary, of course, is control of the major ingredient—the fruits and vegetables in strained and chopped foods. This starts with varietal and seed selection, follows through trials, evaluation in pilot packs, and finally into contracted acreage.

Seeking better varieties is a never ending job. Definite types are needed for purees and strained foods. For example, visits disclosed a new pea in seed-company plots that appeared to have ideal color and texture for strained foods. Some of these were brought back to Fremont and confirmed in a pilot run by Laboratory Service.

This pea proved fine, a small plot was started locally, and acreage was increased the following two years. And finally the variety was adopted for commercial canning five years after its discovery.

The above cautious procedure—with constant evaluation in pilot canning—is necessary because new varieties often change or "break-down" in desired characteristics after a few seasons.

However, other seed problems constantly arise. Recently, the neck on a squash—which had been selected for a nice, meaty crookedness—was seen slowly turning short and straight each successive season. Investigation proved the seed company plant breeder had been selecting away from what he thought was an undesirable characteristic.

Complete statistical records are kept on performance of each variety from its quality and yield standpoint. These revealing studies have caused the company to eliminate two-thirds of its varieties in the past five years—two being casualties last season.

All vegetable seed is supplied to the contracting grower. And in recent years the company has gone to pelletizing treatment to reduce any ground rot, and also Vitamin A supplements to boost germination.

Better Crops

Supplementing the quest for better varieties, and adding greatly to ultimate product quality, has been a concerted program to raise crop yield, uniformity, and freedom from infestation. Some of the company-sponsored projects in the past five years have involved irrigation, crop rotation, pest and disease control, fertilization programs, and advanced harvesting techniques.

Testimony to success of this program is an average yield increase by all growers of at least 1,000 lb. per acre since '48.

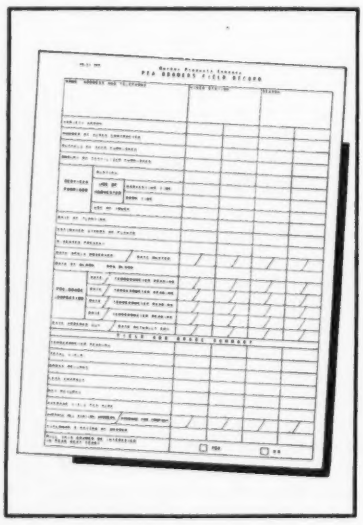
"Dossiered" Contracts

But the story starts with the growers themselves. About 2,500 farmers, with an average 15 acres, currently contract with the company. They are selected by locale, soil type, and ability to produce. And a complete dossier on each contract — acreage, seed used, fertilizer, dusting, planting and harvest dates, etc., including average yield and grade—is kept in the company produce office.

Gerber growers are also imbued with the company "QC" philosophy. Late each fall all meet to hear company technicians describe the effect of new field developments on quality and yield. These sessions are quite candid and no topic is skirted. Growers, for example, can get fair answers as to why certain insecticides are not permitted, or reasons behind size discrimination in certain fruits.

Fertilizer is supplied at cost to growers, and its composition is very carefully based on local soil evaluations by company field men. Laboratory Service gets into the act here with tests that pinpoint soil trace elements

← Tight Crop Control



TO GET top quality vegetables, company collaborates with equipment firms in developing mechanized harvesters, such as this new green-bean picker. Right: Detailed grower records help upgrade field techniques.

needed for the specific crop qualities.

Disease and insect control of contracted crops includes seed treatment, soil treatment, pre-emergence materials, and actual coverage as soon as the plant or fruit "shows." At the latter event, field service men immediately start checking the acreage twice a week–and daily if any trouble develops.

There is preventive dusting and spraying by aircraft. Thus, at pre-set dates all acreage is treated, whether infested or not. Controls used are developed by working with State College people and the supplier, with close adherence to safe standards of application.

Irrigation is another project under company supervision. In the past few years portable systems were leased to growers to combat the dry Michigan summer's toll on green beans. At a per-acre cost of only $21, yield has been increased an additional 2,000 to 4,000 lb. per acre.

A similar crop upgrading–this time due to improved variety, fertilization, and insect control – occurred with squash, which formerly yielded about 5 tons and a return of $60 per acre to the grower. Today the farmer's average runs to 11 tons and $150 profit.

"Peaking" Quality

Product quality has also been boosted in the past few years by some revolutionary changes in harvesting aimed at: (A) Plucking the crop at its quality peak, and (B) defeating the time factor between field and can.

By applying the heat unit theory in estimating harvest time for peas and spinach, and through constant combing of contracted acreage by field men, harvest "date" has now become harvest "hour."

A field sampling maturity test–tenderometer, pressure, color, etc.–tells the field man when an acreage will be at its peak. His car-borne, two-way radio then locates and dispatches harvest equipment and crews to this site. Prior planning in equipment use usually permits the actual harvest operation to begin within one or two hours of optimum crop maturity.

Harvest equipment has become mechanized to permit this speedy movement. Experiments with pea combines were started a few seasons ago to remove the vining station lag. A spinach harvester was developed which straddles rows, cuts, and bulk-loads crates without human handling at a rate of 2 acres an hour. Recently, an experimental mechanical green-bean harvester was developed in conjunction with Chisholm-Ryder. This unit picked about 1 acre per hour in field trials.

Mechanized harvesting coupled with greater yields per acreage helps product quality in another way. Fewer growers and less receiving stations are now needed per crop–hence more uniform grading by a few centrally located trained company personnel is possible.

Take the change in green bean movement. Six years ago there were 1,200 growers and 14 buying stations all contributing a wide variety of crop. Today, only 15 growers supply the bulk of green beans, which funnels through a single purchasing station.

Pea harvesting has also changed, with portable viners and only three permanent stations supplanting the eight vining stations of yesteryear.

Tough Entry

The raw materials of baby food contracted or purchased by the plant have a tough entrance exam to pass before matriculating into process.

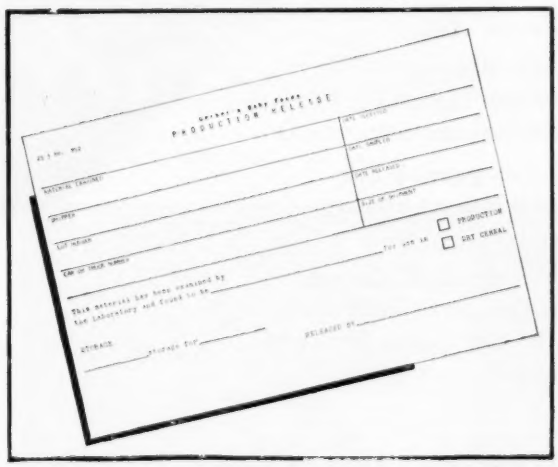
Incoming fruit and vegetables first stop on the 50-ton scale at grading headquarters building. Here, an inspector intercepts an approximate 1% random crate sample of the load. These crates are individually weighed, product is sized, any infestation noted, maturity tested by instrument. A detailed report is filled out, and the load released if it conforms with laboratory standards.

Rejected crops must be re-graded by the farmer and submitted again–but in recent years rejections have been surprisingly few.

Since less control is exerted by the company over fruit than contracted vegetable acreage, particular Laboratory Service attention is devoted to this product as it comes in. For example, fruit from each grower is checked daily for spray residues, vitamin content, and color. These data also permit determining the effect of processing on color and vitamins in product made from this fruit.

Spray residue is a special problem. Usually, field men keep a record of the spray program in any given orchard–hence the laboratory will be pre-warned on possible carryover and can set up special rinsing procedure

Inspection Control →



FINAL QUALITY of a baby food often relies on seemingly minor ingredients, hence after lab testing a release slip (above) is required before use in process. Right: Bacteriologist Allen surveys an amylograph chart of oat flour. He calls this pre-testing "predictive" control.

There's No Belt Spoilage Here!

You benefit two ways when you insist on **Republic Canners' Belt.**

First—you guarantee that there will be no spoilage of your food products—that they will stay perfect. There'll be no odor or taste imparted to them from the belt. **Republic's special compounding** sees to that.

Second—you are assured of longer, trouble-free, money-saving belt life. And where animal fats, vegetable oils, fruit acids, etc., are a factor you can specify **Republic Reprene Canners' Belt.**

Your local Republic Distributor can tell you more about **Canners' Belting,** available in either white, black or amber covers, and about other rubber items you use. If he's not listed in the Yellow Section of your phone book, write us for more information.

REPUBLIC RUBBER DIVISION

LEE RUBBER & TIRE CORPORATION, YOUNGSTOWN 1, OHIO

INDUSTRIAL RUBBER PRODUCTS

when this fruit has entered the plant.

Fruit purchased at an exchange, however, can come from many orchards and much more detailed sampling is needed before the product can enter. And when it does, a comprehensive spray removal system is specified, including acid solution with inhibitors to remove any arsenate and lead residues. Also, constant lab checking follows this fruit right to mixing.

"Predictive" Control

Similar control exists on treated vegetables, particularly squash and spinach. Control of the unpredictable spinach maggot, for example, must be speedy and often near to harvest. Working out a safe application for this control using perathion—which dissipates with heat and moisture—was a recent cooperative accomplishment with Michigan State College.

Incoming ingredients such as starch, sugars, and cocoa, also undergo detailed laboratory scrutiny. Samples are taken in sterile jars from freight car batches before they can be unloaded, and these are subjected to bacteriological, chemical, and other pertinent quality analysis. A written order from the lab indicating the shipment is up to standard releases it into the plant.

One interesting ingredient analysis that Laboratory Service has enthusiastically started is called "predictive control." This is a pre-testing to determine the actual processing qualities of a material.

For example, all starch products are run on a Braebender amylograph to test gelling strength. By making a process-strength slurry of durum or oat flour, for instance, and measuring its peak viscosity at a given temperature, and subsequent set-up on cooling, a definite and predictive formula can be thereby developed for a given soup product.

Bacteriological survey of raw material for spoilage organisms is quite comprehensive. Flour, eggs, milk powder, starches, yeast, and frozen vegetables, for example, are tested for flat sour and thermophilic anaerobes before accepting for processing. Rejection is based on failure to meet set standards of the National Canners Assn.

The control bacteriologist may get into unique problems beyond this routine check of incoming materials. Often, after products are passed they are held in cold storage prior to use, and crate-borne molds—from the soil—have to be contended with. A current project is development of a mold-inhibitor that can be applied to containers such as crates and lug boxes. This will be non-toxic and not impart any odor or taste to the product.

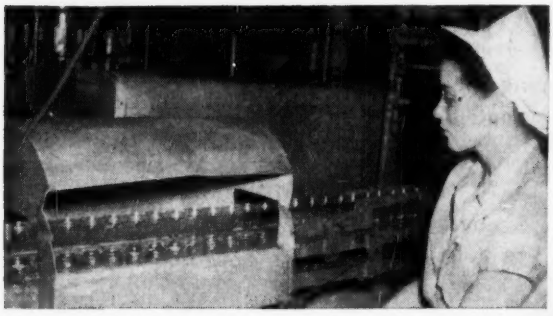
II. Control in Process

Duties of the Quality Control group show up even more boldly during actual processing operations with a dynamic system of line checks to assure conformance to standards and optimum sanitation.

Consider first the in-plant inspectors. These girls are trained for a year before going to their stations—a very necessary background if they are to make precise tests during production runs that often exceed 2,000,000 cans per day.

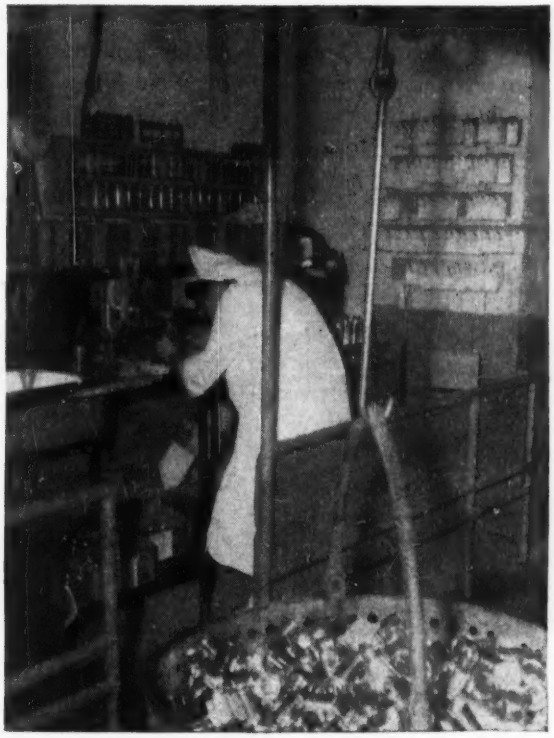
Two inspectors cover the hand trimming belts for fruits and vegetables. One function is to gage the job being done—any culls getting through and thoroughness of paring. Her word to the foreman will immediately place more trimmers on the line.

Line Checks



GLASS JARS are given careful bright-light inspection before they enter filling line.

AVERAGE FILL each hour is charted by this "QC" inspector. Any trends call for immediate line analyses.



ALL BASKETS from cook room are sampled and held for release to packaging if up to standards.

One PEELING or WRINKLED label is too many

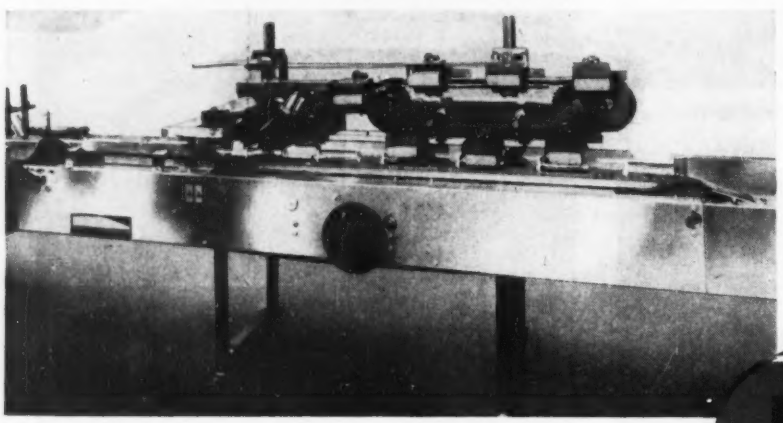
In a mass display of your product, one poorly sealed label can spoil the impression of quality your containers should convey. That hurts sales!

Labels applied by the Thrifty Labeler *stay put*—even though containers are odd shaped or have recessed surfaces, are hot or cold, wet or dry when labeled. Containers can be handled immediately after labeling without danger of label slipping.

The Thrifty Labeler seals the label to the container by an improved device that exerts *continuous flexible pressure* for a longer period of time than conventional machines. Yet you get production speeds from 40 to 120 containers a minute, depending on size. Can be hand-fed or hooked up to your filling and capping line.

Find out more about the high operating efficiency and low initial cost of the Thrifty Labeler.

Write for complete information



THE NEW Thrifty LABELER

HIGH SPEED
Labels up to 120 containers a minute.

EASILY ADJUSTED
Handles a gallon jug or a 4-ounce bottle

USES HOT, COLD OR THERMOPLASTIC Adhesives

CONTINUOUS MOTION

STRAIGHT-LINE DESIGN

FLEXIBLE-PRESSURE SEALING
Bonds labels so peeling and wrinkling are prevented.

ACCURATE LABEL REGISTRATION

LOW COST
Low initial cost, low maintenance, high operating efficiency.

SEE US AT THE
CANNERS' SHOW
Atlantic City, Jan. 23-27. Booth C 15.

PACKAGE MACHINERY COMPANY • Springfield, Massachusetts
NEW YORK PHILADELPHIA BOSTON CLEVELAND CHICAGO ATLANTA
DALLAS DENVER LOS ANGELES SAN FRANCISCO SEATTLE TORONTO MEXICO, D.F.

PACKAGE MACHINERY COMPANY

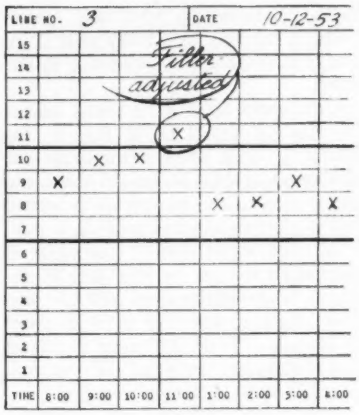
Also, belt inspectors periodically random-check product for conformance to standards, routing samples to the lab for swab tests.

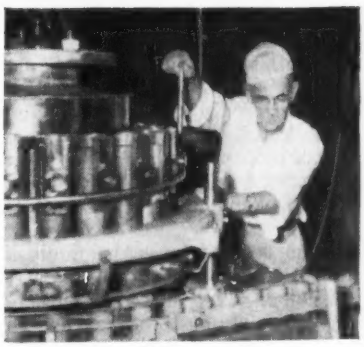
Next station for the "QC" inspector is at the fillers. Here, five sealed cans or jars are pulled from each of six filler lines each hour. These are measured for hot and cold headspace, and the cold weight recorded.

If any drastic drift in headspace or weight shows up, the inspector immediately reports it to both line foreman and her own chief. Usually it's a matter of filler adjustment. But occasionally the check catches a formulation error necessitating holding of that batch.

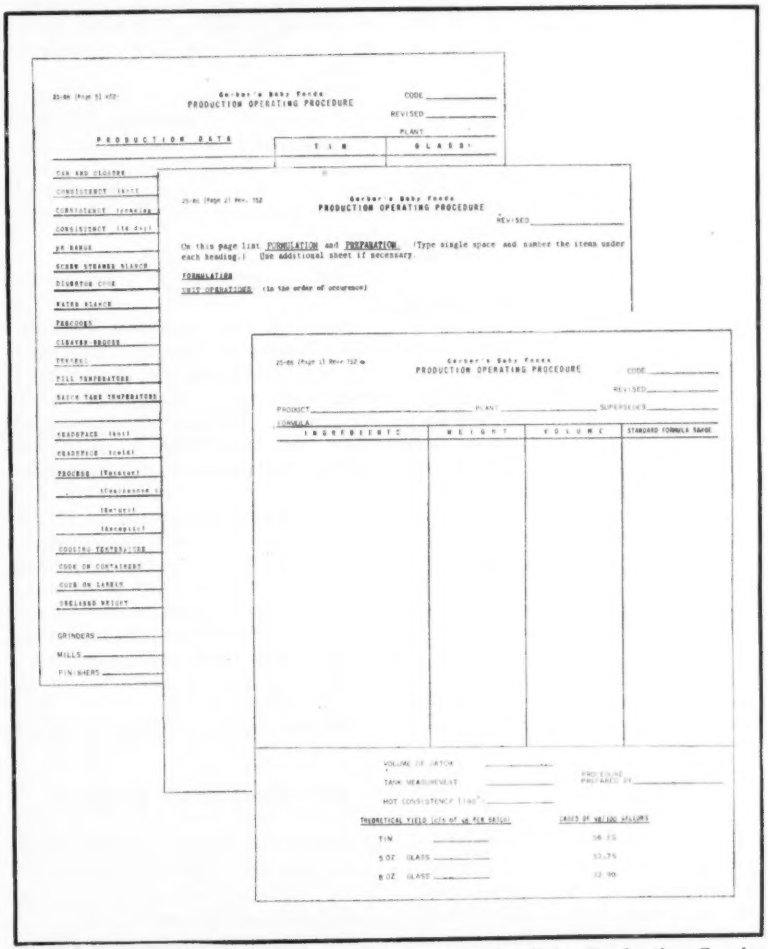
However, the real use for these checks comes when data is averaged and assembled on a frequency distribution chart, which clearly shows any trends away from optimum range of fill.

Final line inspection station is at the end of the cooling canal. Here, each retort basket is held on-the-rail until at least three cans or jars have been tested for vacuum, head space, temperature, consistency, color, and flavor. Any question at all, and the crater is shunted aside for further analysis.





HEADSPACE CONTROL chart is tabbed on spot by inspector. Photo: Deviations above or below control limits result in filler adjustment.



THESE INSTRUCTION sheets are filled out in detail by Production Service as an exacting working guide for in-plant operations. As process standards are narrowed, changes are added to procedure.

Works With Production

While the chief of inspection receives first word of any unusual deviations out on the lines, if it looks like a production problem—which is usually the case—the trouble-shooting Production Service experts are dispatched to work out the cure.

Because he is directly responsible for establishing correct processing procedure, and also well aware of laboratory standards, the Production Service man is uniquely qualified for his job.

All new products and any basic changes in formula or methods of processing are worked out by Research. But these new procedures are simply turned over—still in pilot quantities—to the chief of Production Service. He then sets up the working process and supplies production with detailed instructions for carrying it out.

Actually, three associated "Production Operating Procedure" sheets are drawn up for each product. One lists the ingredients to be used, their weight, volume, and standard formula range. Also the volume of the batch to be made, its hot consistency, and theoretical yields in terms of filled cans.

The second sheet provides a complete list and description of the unit operations according to their sequence, and data includes types of wash and peel, trim operation, method of blanching, pulping, type of mixing, and sterilizing method.

The third operating sheet gives exact numerical values for such things as pH range, consistency, temperatures (of wash, peel, blanch, cook, fill, and cooling), headspace, code, and declared weight. Also mechanical settings for such equipment as grinders, mills, finishers, sifters, and cutters.

Hence by simply comparing incoming data collected by "QC" inspectors on the floor with the procedure sheets,

it is usually easy for Production Service to pinpoint any trouble source.

In addition to constant data from "QC" inspectors, Production Service is aware of overall in-plant performance through a daily product run summary sheet. This tabs type and quality of all raw materials used, plus actual times, temperatures, and settings of process operations. The sheet also includes lines for comments on sanitation and control deviations.

In any cannery, one of the most annoying causes for a sudden finished-product deviation is the complete omission of an ingredient in the batch. This possibility has been scotched by Production Service with a simple chart listing all ingredients next to a series of numbered columns for batches. Each ingredient box in the batch column must be checked-off by the operator before the batch can be "dropped".

Eliminating the Count

Following up on its comprehensive program of testing raw materials, Laboratory Service and its bacteriologist are equally involved in keeping product from literally being "counted out" in process.

Fruits and vegetables are sampled from wash reels, blancher, and up to the filling operation. These line checks are made to determine any build-up of spore-forming spoilage bacteria throughout the process, and they permit a concerted effort by the sanitarian to improve conditions at any faulty locale.

Microbiological examination of the product is repeated after retorting and passage through the cooling canal. In this latter operation, water chlorine concentration must be enough to be bactericidal, but not too severe to etch the cans. Hence, presence of bacteria of mixed types in the container could indicate too low residual chlorine in this water and perhaps faulty containers. Also, any spore-forming bacteria in a fairly pure state would indicate under-processing in the retort.

Containers from each retort basket are also incubated at 98 deg. F. for 14 to 21 days, with a duplicate set incubated at 131 F. for 10 days—the latter incubation serving as a severe test to stimulate spore growth, if any.

All well water used in the plant is tested as a routine by Standard Methods of Water Analysis to spot any possible contamination by ground water or sewage. Washing water is stored in an elevated tank and chlorinated, as used, by an automatic feeder.

While the chlorine concentration used—2 ppm.—has proven effective in preventing build up of molds, yeasts, and slime on both raw materials and equipment, constant tests assure it to be in no way detrimental to product quality.

While routine swab tests prove good insurance in detecting the start of undesirable build-up of bacteria in process, swab findings are rare, since there is a solid program of preventive techniques by the chief sanitarian.

Systematic Sanitation

First off, the sanitarian consults with Production Service, Engineering, and Purchasing on the sanitary design of any contemplated new equipment. Hidden corners, angle-irons, and other nesting places for bacteria are thus ruled out. Also, constant improvement in sanitary design of existing equipment is carried out in cooperation with Engineering.

Next, any new equipment entering the process line is studied for its most efficient cleaning method. Working with the bacteriologist, the sanitarian probes new methods and detergents to set up a low-cost but drastic sanitizing routine.

After an exacting cleaning procedure is established for a new equipment unit, this information is added to the "Production Clean-Up Routine" booklet, which details sanitation throughout the plant and serves as a "bible" for the 18-man clean-up crew in its nocturnal activity.

While the clean-up instructions provide exact standards for nightly sanitation of all machinery, also listed are some hourly, weekly, and yearly routines for employment on such critical equipment as blanchers, mesh-conveyors, and fillers.

Take blanchers. These are shut down every hour, drained, flushed, and refilled. Then at night they are flushed with a steam gun and detergent. At week's end they are filled with a hot detergent bath, rinsed with another chemical, and then steamed. And at year's end this weekly treatment is repeated with much longer doses, including use of a concentrated liquid caustic.

Inspection belts, pumps and valves, cutters, dicers, grinders, and peeling equipment are also shut down every 2 hr. for flush treatments, in addition to special chemical and scrubbing routines and dismantling each night and weekend.

Continuous processing systems, such as the Votator and its associated sanitary piping and valves, are treated to an in-place circulating type rinse both nightly and weekly. First there's hot water to clear the equipment, then cool water for 5 min., followed by a straight-path run of 250 gal. of special detergent. A clear warm water rinse, succeeded by a final circulation of weaker detergent solution, readies the unit for use next day.

Detailed sanitizing instructions are also adhered to in cleaning produce trucks after use, both daily and weekly. Also routines are set up for utensils, floors, drains, walls, ceilings —in fact, anything tangible within the plant space or touching the product from field on in.

III. Control of Product

Naturally, the best raw material and in-process control would be meaningless unless the aim for product standards were high—and Gerber Quality Control technicians display enviable enthusiasm in a concerted program to add more and more meaning to their daily routine.

Like sales department members, the "QC" workers have learned to be primarily consumer-minded. For after all, they reason, its the ultimate, critical user who really determines exact standards for such things as color, texture, and consistency.

Hence, product control — through adherence to precise standards—really starts with the "cuttings," where selected individuals scan finished goods critically for market perfection.

Three types of cutting committees prevail. Most critical of prevailing laboratory standards is the Central Committee, consisting of three non-technical company officials—currently the assistant to the president, a sales executive, and the home economist—all with babies at home.

Being unfamiliar with exact current standards and methods of achieving them, this committee, in its weekly cutting, is capable of rendering some very subjective, consumer-like judgments on the product—judgments that often have a profound effect on the thinking of Quality Control.

Economic Research has another type of cutting committee to evaluate product. This consists of panels of mothers, selected on a local, sectional, and nationwide basis. The local group is often used to provide a quick "answer" on the appeal of a new product, while a sectional committee cutting usually precedes the introduction of a new line in a geographic market area.

The general nationwide committee,

Schoettle Case Histories:

true story of a

Purchasing Agent in a Lather

CASE HISTORY #39 The 200,000 folding paper boxes that this company* ordered were ready—and then the Purchasing Agent phoned. He was really in a lather! A raw material used in the manufacture of the product became suddenly unavailable and the boxes were useless. What could we do about it, he pleaded. We resold these boxes to another customer at no loss to the manufacturer for whom they were originally made. We work hard to get customers. We work hard to keep customers, that's why purchasing agents love us!

CASE HISTORY #62 A large electric supply company* required an original construction of a folding paper box in which to ship bolts, nuts and screws; and also provide a dispensing bin on the shelf. The purchasing agent worked himself into a lather trying to figure out a box that could do a "complete" job. Half a dozen manufacturers submitted "Goldbergs" that were totally impractical. Finally he did what he should have done immediately—call on Schoettle. In short order, Schoettle produced a box that was praised very highly and the Purchasing Agent relaxed and smiled again.

• Whether it's speed or ingenuity, depend on Schoettle to produce! We specialize in "unlathering" purchasing agents . . . we never let them down! For quality folding paper boxes—as you want them—when you want them, depend on Schoettle!

*name on request

EDWIN J. SCHOETTLE CO.

533 NORTH ELEVENTH STREET • PHILADELPHIA 23, PENNA.

Designers and Manufacturers of Paper Boxes with Buy Appeal

When the FLAVOR is there -the Customers are too!

Magnify Natural Food Flavor as More and More Leading Food Processors Do . . . with Zest

Your brand will be their favorite if you use *Zest* to produce more satisfying, tastier products. This miracle seasoning—pure Monosodium Glutamate—intensifies natural flavor *already in* canned foods, without adding flavor, aroma or color of its own. Low cost *Zest* is effective in tiny amounts, added either before, during or after processing. Use it in canned soups, fish, stews, vegetables, meats, poultry . . . and scores of other foods. Boosting food flavor with *Zest* is a proven method of increasing volume sales in both canned and frozen foods. Write today for all the details about profit-making *Zest!*

Zest®

-for food that tastes better sells better!

Staley's 99+% Pure Monosodium Glutamate

A. E. Staley Mfg. Co., Decatur, Illinois

OTHER QUALITY STALEY PRODUCTS FOR FOOD PROCESSORS

SWEETOSE®—enzyme-converted sweetener for firmer texture, better flavor

Sta-Sol®—lecithin concentrate gives more complete mixing, prolongs shelf life

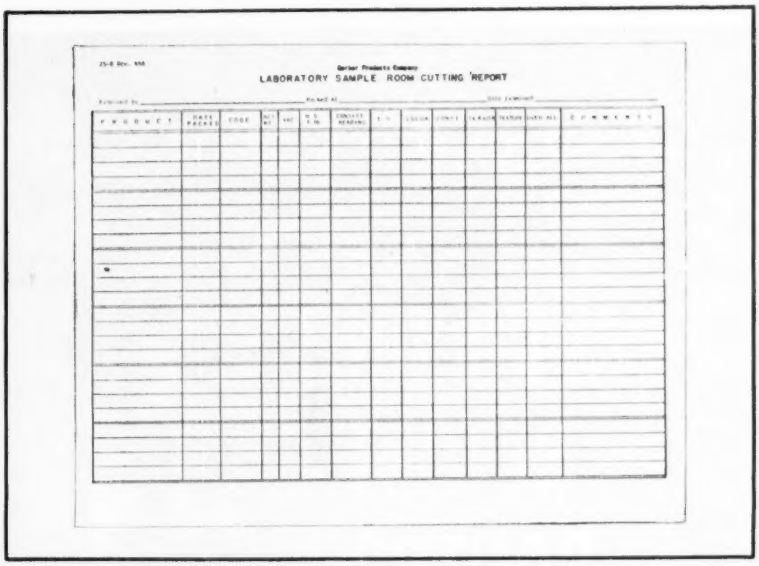
Staley's C. S. U.—High quality standard corn syrup

Use coupon on page 209.

consisting of 500 mothers, is organized from broad income and nationality cross-section and provides a wide, overall continuous grasp of the acceptability of all products.

A third approach to product evaluation is afforded by the foremen's cutting, held daily at 9:30 A.M. and attended by all production foremen as well as key workers from Quality Control. Covering all food packed the previous day, this permits objective criticism of each product's conformance to existing standards.

Still another unique cutting is the annual "bee" where all plant personnel and local mothers taste-test several hundred unlabeled samples of baby foods for an unbiased evaluation of prevailing company standards as against competition. As in the other cuttings, factors such as texture, color, flavor, and consistency are rated.


LABORATORY SAMPLE ROOM CUTTING REPORT

PRODUCT CUTTING after 14 days is a lab routine to pinpoint important qualities before each production run is released to shipping.

Upgrading Standards

What do these unceasing cuttings and product evaluations do for Quality Control?

For one thing, they create an unbeatable quality-consciousness among workers and management that spells infinite and ready cooperation with "QC" personnel as they carry out their daily routine.

But more than that, what often results is a concerted program to sharpen or change standards and ultimately capture more of the market through improved or more desirable quality.

One thing always subject to dramatic change, for example, is product consistency. No one can predict for sure just what this quality should be in a given product until cutting committee analysis provides the tip-off. Hence a precise new standard, rapidly applied by "QC", often results in sizable market improvement.

To keep close tab of this all-important consistency factor in all products, large master charts representing a year's production are displayed in the laboratory. Any deviation from desired standards boldly shows up on these frequency distribution records, and product consistency in relation to marketability can be pinpointed.

Color has been another big factor in consumer acceptance. For example, one important problem plaguing baby food processors has been the "stratified" appearance, near the surface of glass jars held on the shelf for any time.

This annoying surface discoloration is related to oxidation and the amount of air in headspace. Hence, Quality Control embarked on a two-fold program of product deaeration and headspace control to tighten up on standards and eliminate this nuisance.

Wherever practical, deaeration is now applied to all fruit and vegetable purees where the discoloration problem exists.

To check the efficacy of this operation, a unique laboratory test was devised. A filled jar is clamped in a stand, lid punctured with a pressure fitting, and water inserted in the headspace. Vacuum is then applied through a graduated tube and the occluded air in the jar will be pulled up through the water and into the calibrated section as a bubble.

If occluded air content—as shown up by this "deaeration test"—is high, Production Service will immediately check the in-plant operation for pump leaks, temperature, etc., and usually cure the trouble.

Proper vacuum and headspace control, of course, is another way of minimizing oxygen in the jar, and a systematic effort is underway to improve the tolerances for this variable at the filler.

"SQC" Does It

Data for headspace control originates during continuous evaluation of containers at the filler inspection station. Measurement is made to within $\frac{1}{32}$ in. with a calibrated ruler on five containers per hour per line, and these figures are accumulated in the Inspection Service laboratory, where a team of girls subject them to statistical quality control analysis.

Based on this analysis, a headspace frequency distribution chart has been set up with a permissible 4/32 in. control range for this variable. This chart is graduated into 16 variations per $\frac{1}{4}$ in.—from $\frac{3}{32}$ to 16/32 in.—with control range, for example, bordered by red lines at $\frac{7}{32}$ and $\frac{11}{32}$ in.

Hence, if the average of any five containers in a particular hour indicates a headspace below $\frac{7}{32}$—which can lead to poor vacuum in the can—this will show up as a warning red dot out of the control zone. Similarly, too much headspace will appear as a warning signal above the $\frac{11}{32}$-in. line limit.

Also included on this control chart is the average hot and cold headspace for the day as against a desired range, as well as the average cold weight of the filled container and its desired range. In addition, there is recorded the actual percentage of time both above and below established control limits.

By posting these charts by the filler lines and enlisting the foreman's cooperation it has been possible to narrow headspace operating control to its present 4/32 in. within the past year.

And all indications point to the further trimming of this variable in the near future.

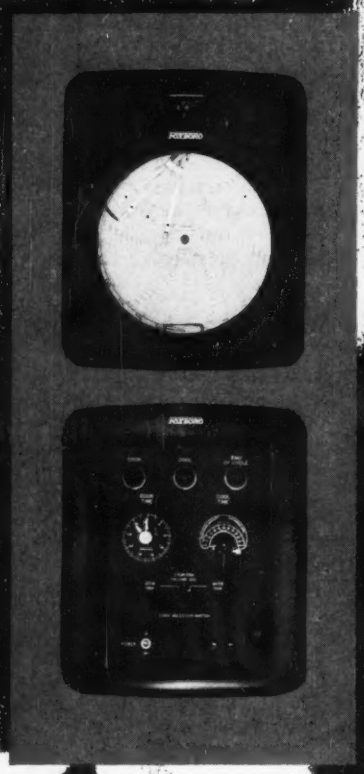
Other benefits, however, are also expected to accrue from this statistical approach. For one thing, it will be possible to make very detailed comparisons of all filling lines at the end of the year, and a constructive program can be launched to standardize to the efficiency of the best performing operation.

Also, more precise control of headspace leads, in turn, to better weight control. And aside from the obvious product savings factor, the problem

(*Turn to page 155*)

See it at the Canners' Show!

"ADD-a-UNIT" RETORT CONTROL



. . . A new concept in automatic control that saves both time and money!

START WITH basic Foxboro Control of temperature or temperature and pressure.

ADD control of other variables as process demands change . . . in easily-installed control units . . . without interrupting production.

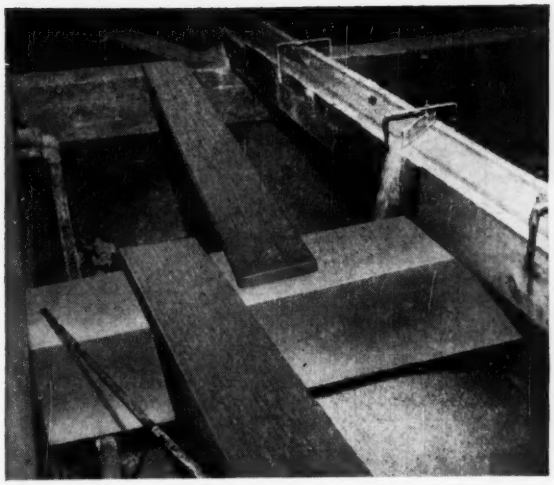
GET any degree of control you desire . . . up to and including complete automatic control of steam cook, steam cook and pressure cool and water cook.

SEE THIS "CONTROL YOU CAN BUILD ON" IN BOOTH NO. D-17 AT THE CANNERS' SHOW, ATLANTIC CITY

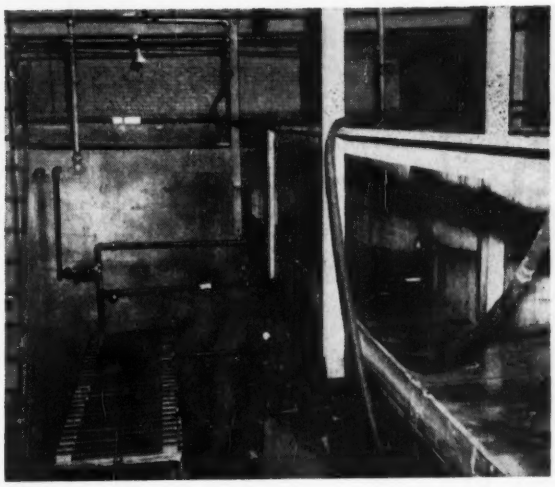
FOXBORO
Reg. U. S. Pat. Off.

THE FOXBORO COMPANY
301 Neponset Ave., Foxboro, Mass., U.S.A.

FACTORIES IN THE UNITED STATES, CANADA AND ENGLAND



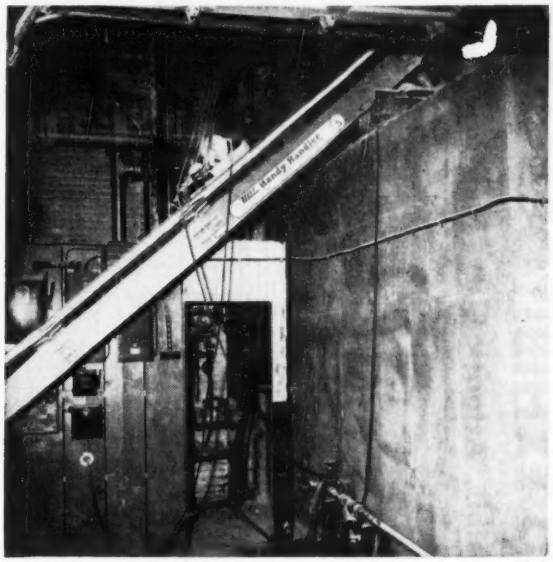
BULK SALT from railroad cars is distributed into brine tank by hand-set scraper-baffles over conveyor.



IN WOOD TANKS (right) filter-aid is mixed with spent brine, which is then clarified in filter below.

BULK BRINING Spells Big Benefits

When the old bag-and-mix method slowed processing, sapped labor, wasted salt, and finally even began edging in on foot room, Ritter radically switched—to a direct car-to-tank technique that not only speeds action and saves work but also pays for itself



PORTABLE CONVEYOR of scraper type quickly transports salt from car to brine maker.

IVAN C. MILLER
Associate Editor, "Food Engineering"

Brining speed—doubled. Labor requirements on brine make-up—reduced. Product quality—improved.

These are strides made by P. J. Ritter Co., Bridgeton, N. J., through installation of a new system for preparing brine from bulk rock salt.

● **What's more, figures on the '53 season, when the system had its debut, are expected to reveal that savings on salt alone have defrayed costs of the new installation.**

Here's what led up to the change: Prior to '53, the company made its sodium chloride brining solutions from refined salt purchased in 100-lb. sacks. The brine was prepared by dissolving salt in water in power agitated mixers.

But, year by year, additional mixing equipment and labor continually had been required as production of brined products rose. And finally the straw broke the camel's back when need for still further mixer expansion was balked by an already over-crowded area.

That necessitated the change. In an area apart from the congested brining operation Ritter constructed a 3-car capacity concrete brine-making tank with resistant lining. This tank is now filled with charges of rock salt direct from the cars in which the salt is bulk-delivered.

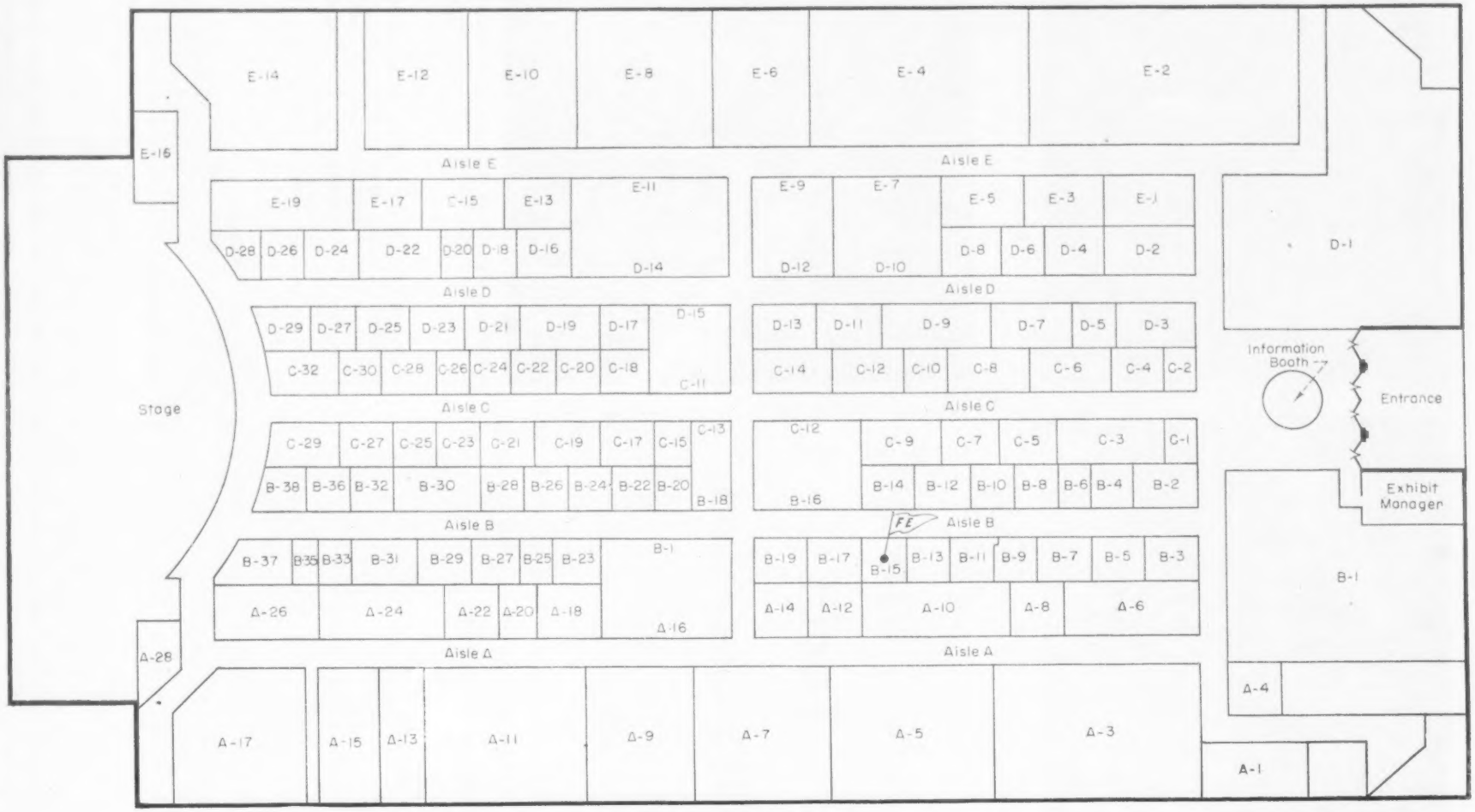
Coming from the car—at first by gravity, then by scoop—the salt goes into the feed trough of an elevating conveyor. This carries it up over the tank top and discharges it onto a horizontal distributing conveyor that travels the length of the tank. Discharge from this conveyor, at desired locations in the tank, is controlled by baffles (see first photo).

Brine Self-Purifying

About 3 ft. up from the bottom of the tank, and extending its length, is a perforated pipe through which make-up water or dilute brine is admitted to the salt bed. To start the brine maker, water is admitted to the level of the inlet pipe, then salt is added to any level above the inlet pipe, or until the tank is filled. (*Turn to page* 156)

FLOOR PLAN AND EXHIBITORS AT CANNERS' SHOW

47th Annual Exhibit, Atlantic City Auditorium, Jan. 23-27, 1954



TIME OF EXHIBITS

Sat.—10 A.M.-5:30 P.M. **Sun.—1 P.M.-5:30 P.M.** **Mon.—10 A.M.-5:30 P.M.** **Tues.—10 A.M.-5:30 P.M.** **Wed.—10 A.M.-3:30 P.M.**

LIST OF EXHIBITORS

(Companies and Booths)

—A

A-B-C Packaging Mach. Corp....C-19
Ace Specialty Mfg. Co.....D-26
Acme Steel Co.....C-27
Addressograph-Multigraph Corp..C-29
Algene Marking Equip. Co.....D-4
Aluminum Cooking Utensil Co....C-7
Aluminium Co. of America.....C-3
American Can Co.....E-11 & D-14
American Mach. Corp.....D-18
Ams Machine Co., The Max.....B-11
Anchor Cap & Closure Corp. of Canada.....A-7
Anchor Hocking Glass Corp.....A-7
Angelus Sani. Can Mach. Co....A-15
Armstrong Cork Co.....B-7
Associated Seed Growers.....A-6
Audubon Wire Cloth Corp.....A-17

—B

Baldwin-Lima-Hamilton Corp....A-26
Ball Brothers Co.....A-22
Barker Co.....E-12
Barnes Co., W. F. & John.....A-8
Barry-Wehmiller Mach. Co.....A-9
Basic Vegetable Products.....C-24
Berlin Chapman Co.....E-15
Berry Canvas Goods.....D-23
Bliss Co., E. W.....D-22
Brooks Chemicals.....C-26
Buflovak Equipment.....B-31
Burt Machine Co.....D-10 & E-7

—C

Calvert Litho. Co.....D-8
Cambridge Wire Cloth Co.....E-16
Canner Publishing Co.....C-1
Canners' Machinery Ltd.....E-5
"Canning Trade, The".....C-2
Chain Belt Co.....B-16 & C-11
Cherry-Burrell Corp.....E-17
Chisholm-Ryder Co.....A-3
Chisholm-Ryder Co. of Pa.....A-3
C.I.T. Corp.....B-14
Clark Equip. Co.....Stage
Columbia Eng. Service Co.....B-22
Container Corp. of America.....B-27
Continental Can Co.....B-21 & A-16
Corn Products Sales Co.....B-10
Corneli Seed Co.....B-9
Crites Moscow Growers.....C-5
Crown Can Co.....A-11
Crown Cork & Seal Co.....A-11

—D

Darworth, Inc.....C-23
Dewey & Almy Chemical Co.....B-19
Diagraph Bradley.....B-29
Diversey Corp.....B-8
Dixie-Way Mach. Co.....E-19
Dole Engineering Co., James.....A-8
Douglas-Guardian Whse. Corp...B-38
Dudley Mach'y. Co.....E-14

—E

Economic Mach'y. Co.....D-29
Electric Sorting Mach. Co.....C-28
Elgin Mfg. Co.....D-28

—F

Fawick Airflex Co.....A-28
Ferguson Co., J. L.....D-7
Ferrel & Co., A. T.....C-15
Ferry-Morse Seed Co.....B-13
Fiske Brothers Refining Co.....D-11
Fitzpatrick Co., W. J.....D-2
FOOD ENGINEERING.....B-15
Food Mach'y. & Chemical Corp. D-1 & E-2
"Food Packer".....B-4
Foxboro Co.....D-17

—G

Gallatin Valley Seed Co.....C-18
General Electric Co.....C-22
Griffith Laboratories.....D-25
Groen Mfg. Co.....A-12

—H

Hamachek Mach. Co., Frank.....C-4
Hamilton Copper & Brass Works..B-32
Hazel-Atlas Glass Co.....D-3
Heekin Can Co.....C-9
Horix Mfg. Co.....E-3
Huntley Mfg. Co.....C-13 & B-18
Huron Milling Co.....A-20

—I

Internat. Minerals & Chem. Corp.B-33

—K

Kieckhefer Container Co.....E-13

—L

Langsenkamp Co., F. H.....A-24
Lee Metal Products Co.....E-1
Link-Belt Co.....C-8

—M

Mayer & Sons Co., H. J.....A-4
Michael-Leonard Co.....B-5
Michigan Litho. Co.....B-6
Mojonnier Bros. Co.....B-35
Morrison Bros. Seed Co.....C-25
Morton Salt Co.....B-12
Motorola, Inc.....B-28

—N

National Can Corp.....D-9
National Container Corp.....D-21
New Jersey Mach. Corp.....D-19
Northrup King & Co.....C-12

—O

Oakite Products, Inc.....C-10
Olney, George J.....C-17
Owens-Illinois Glass Co.....E-8

—P

Pfaudler Co.....D-15 & C-16
Productive Equip. Corp.....B-26
Pure Line Seeds, Inc.....B-25

—R

Rapids-Standard Co.....C-32
Reeves Pulley Co.....C-30
Rietz Mfg. Co.....A-2
Robins & Co., A. K.....A-5
Rogers Bros. Seed Co.....B-36
Rossotti Litho. Corp.....D-16
Rust-Oleum Corp.....B-20

—S

Scientific Salting Co.....B-12
Scott Viner Co.....E-9 & D-12
Sellers Injector Corp.....D-6
Simplicity Engineering Co.....B-23
Sinclair-Scott Co.....C-21
Standard-Knapp.....E-6
Stange Co., William J.....C-6

—T

Taylor Instrument Co's.....C-14
Thatcher Glass Mfg. Co.....D-27
Towmotor Corp.....B-30
Tri-Clover Mach. Co.....D-24
Tygart Valley Glass Co.....D-13

—U

Union Bag & Paper Corp.....B-37
United Co.....B-1
U. S. Bottlers Mach'y. Co.....A-1
U. S. Electrical Motors.....B-17
U. S. Steel Corp.....E-10
Urschel Laboratories.....A-10

—V

Vaughan's Seed Co.....D-20

—W

Walker-Wallace.....A-14
Wallace & Tiernan Co.....D-5
Warner, Inc., Lansing B.....B-3
Washburn-Wilson Seed Co.....B-24
Waukesha Foundry Co.....A-18
Weston Electrical Inst. Corp.....C-20
White Cap Co.....E-4
Woodruff & Sons, F. H.....B-2

To be sure...

Continental has tailor-made package service for table specialties

Continental packages almost everything

If you prepare out-of-the-ordinary foods, you're sure to appreciate Continental's tailor-made package service. This goes far beyond furnishing you with a dependable supply of handsomely lithographed containers. When you become a Continental customer, we go all out to please you. We make available the best in engineering and research facilities, in as little or as vast a quantity as you can use. In all our dealings with you, we treat you as if you were our only customer. We do things your way if humanly possible. Wouldn't you like to get better acquainted soon?

Is your product listed here?

Let us show you containers designed for:

Brown Bread	Glazed Fruit	Plum Pudding
Candy	Ice Cream Mixes	Popcorn
Date Bread	Nut Bread	Potato Chips
Fountain Syrups	Nutmeats	Pretzels
Fried Noodles	Nut Butters	Shoestring Potatoes
Fruit Cake	Peanuts	Table Syrup

and many other food specialties

CONTINENTAL CAN COMPANY

CONTINENTAL CAN BUILDING • 100 East 42nd Street, New York 17, N. Y.

EASTERN DIVISION
100 E. 42nd St., New York 17

CENTRAL DIVISION
135 So. La Salle St., Chicago 3

PACIFIC DIVISION
Russ Building, San Francisco 4

SIZE OF OPERATION is revealed in air view. Note 746-ft. tunnel (four arrows) through which empties are conveyed from Continental's can-making factory (left) to the two plants (1) and (2). Other buildings are: Refrigerated warehouse and main offices (3) scale house (4), outside boilers (5), canned goods warehouse (6, 7, 8), machine and fork-truck maintenance shops (9), waste disposal plant (10), empty lug box area and storage (11), double track railroad spur (12).

Top-Notch Tomato Operation

Actually comprising two canneries—one for juice, other for five products—it's under constant "modernization maintenance" program that keeps cost low, output high, and quality superior

C. R. HAVIGHORST
Senior Associate Editor, "Food Engineering"

Plant modernization is a *continuous program* at Bercut-Richards Co., Sacramento, Calif. Ever since the company began operation 20 years ago, a large slice of each year's profits have been plowed back as capital investment in machines, equipment, and buildings.

PURPOSE: To maintain, on a perpetual basis, buildings and processing lines of advanced design in the interest of low production costs, high volume, and product quality.

RESULT: a plant of exceptional flexibility, capable of: (1) Receiving and processing large quantities of raw materials efficiently and economically, (2) handling overloads caused by surges due to favorable growing weather, and (3) dividing processing operations when harvest of one product overlaps that of another.

When the company first began operation two decades ago, the then-existing plant was comprised of but a very small segment of the present company layout.

During these 20 yr., plant facilities have gradually grown and processes have been improved by advanced engineering.

Today, the closely integrated operation actually consists of two canneries, a refrigerated warehouse of 1,250,000 cu. ft., and a dry warehouse with capacity of 3,000,000 cases of canned products.

While this report deals only with the canning of tomatoes, Bercut-Richards also cans cling and freestone peaches, pears, asparagus, and fruit cocktail. The refrigerated warehouse is used largely for storage and ripening of peaches and pears prior to processing. Rooms are so constructed as to

take advantage of either the cold or hot slide of the refrigeration system. Temperatures may be controlled from −10 to +80 deg. F.

Because of its proximity to growing areas in California's lush Central Valley, about 75% of all raw material is trucked from farms and orchards within a 25-mile radius of the plant. The remainder comes from a radius of less than 40 miles.

Traditional processes for canning six kinds of tomato products have been mechanized gradually. Each season finds the testing or the permanent in-line installations of new machines or equipment. The engineering and product quality studies made during the tests determine if the machine is to be purchased.

As with some other high acid products, the technology governing tomato processes are largely product control measures. Samples are constantly taken from the lines and analyzed in the lab for quality.

Handling Incoming Products

Arriving on truck-trailer rigs, tomatoes are received at the scale house. Here on dual (60 ft.) scales, net weight of each delivery is recorded. Every load is checked by State Department of Agriculture inspectors for minimum standards of color and for undesirable quality factors. Representative product samples are taken for analysis in the laboratory for quality and grade. Growers are paid on the basis of this analysis.

The material receiving area is designed and centrally located so as to efficiently serve both canneries. Truck-trailers move up a ramp to the large concrete unloading area, which is on the same level as the floors of the canneries.

Below the unloading area is a parking space for trucks loaded with incoming raw material. However, it is rarely necessary for trucks to wait at this point. At least five truck-trailers can be spotted in the unloading area simultaneously.

Wheels of the big units have hardly stopped rolling before fork-trucks—four to a semi-trailer—begin to unload lugs. (These boxes were earlier stacked 7-high on pallets at field stations, and loaded on truck-trailers by fork trucks.) Normal time for unloading 22 pallets, or 924 lug boxes, is 15 min. Pallet loads are temporarily stacked under cover to protect their contents from heat of the sun. Then, as needed, they are moved by fork-truck to the box dumpers in the two canneries.

FOR CLOSEUP OF LINES turn to this month's special FE Picture-Flowsheet: "Dual Tomato Cannery—How It 'Ticks'." It unfolds on pages 86-89.

The fork-truck fleet has grown to 25 units since the first one was put in operation. On a record day it has unloaded and handled 82,000 lug boxes of products! Compared with hand-truck unloading, labor savings are estimated at 90%. Of equal importance is the efficiency provided at this point by mechanized handling, which has contributed significantly to increased production volume of the plant.

Fork-trucks shuttle from temporary storage to lug box dumpers keeping a supply of loaded pallets on hand to be fed to these semi-automatic units. Latest models, in use here are comprised of two troughs, each of which will accommodate a stack of 7 lug boxes. A belt conveyor, located in the floor of each trough, operates continuously. Troughs are filled and emptied alternately.

One hand truck operator moves the tiers of lug boxes from pallets to troughs. By shifting a lever, the dumper operator reverses the trough's positions. The empty one revolves 180 deg. to an upright position, and the filled trough moves in the same arc to a horizontal position. Weight of the full boxes causes them to move to the end of conveyor, where they fall onto an empty box conveyor. Tomatoes drop through into a tank of wash water that cushions their fall.

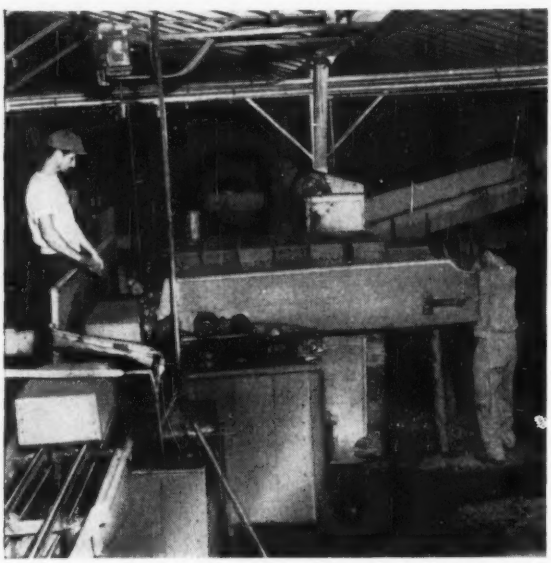
Compressed air bubbling through the water provides agitation to wash field dirt and dust from the tomatoes. There are six of these dumping and washing units, serving the six processing lines—two in Plant 1 (juice), four in Plant 2 products.

Versatility a Feature

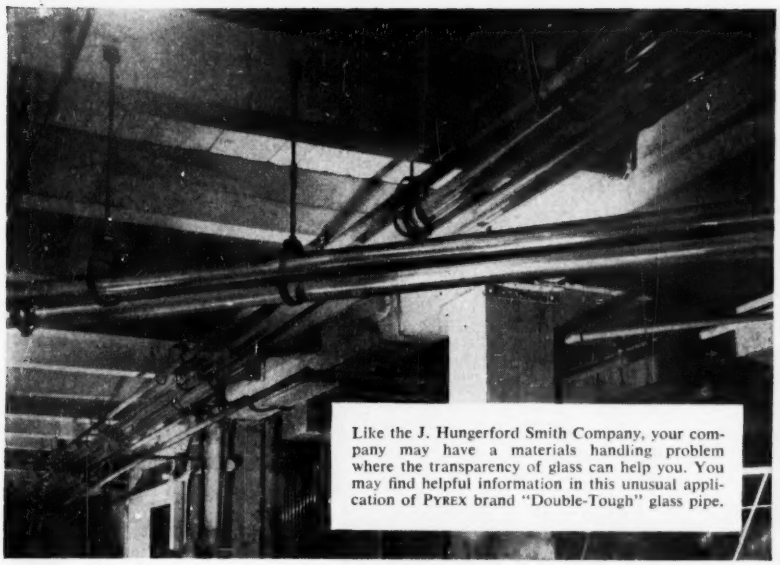
Prior to erecting Plant 1, it was necessary to revise the then-existing processing lines when changing-over from one product to another. If harvest seasons happened to overlap, management faced knotty problems in deciding which product was to be

Tomatoes Received, Lug Boxes Emptied

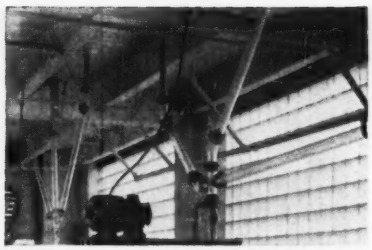
FORK-TRUCKS remove pallet loads of filled lug boxes from truck-trailers and move them to dumping area.



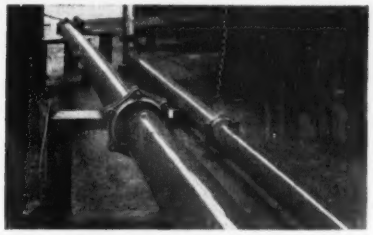
DUMPER requires two men—one to hand-truck lugs from pallets to unit, other to operate machine.



Like the J. Hungerford Smith Company, your company may have a materials handling problem where the transparency of glass can help you. You may find helpful information in this unusual application of PYREX brand "Double-Tough" glass pipe.



Because PYREX pipe is easy to clean *in place*, you can switch quickly from one product to another. And the smooth surface of PYREX brand glass pipe offers no collecting places for materials that might threaten product purity.



Detail of PYREX pipelines handling cherries from outside tank storage to processing (left) and returning storage solution to tanks (right).

Materials handling innovation

How this PYREX® pipe installation does the work of 5 men

It once took five men plus an elevator operator and a truck driver most of a day to move 70 barrels of cherries from outside storage to the start of the processing line.

This was the materials handling problem facing Carvel Martin, manager of J. Hungerford Smith's Rochester, N. Y., plant—a large producer of syrups and fruits for the fountain trade and ice cream manufacturers.

Two years ago, the company installed the PYREX pipeline shown in part above. Now cherries flow as fast as processing can handle them and only *two* men do the job.

In addition, the cherries travel in greater safety. Spoilage and damage due to improper handling have been eliminated. Materials handling has been cut to the bone. And the system paid for itself in less than one season.

No wonder Carvel Martin calls the performance of this PYREX pipeline "Spectacular."

Transparency made it possible

Pipes of other materials were tested before PYREX brand "Double-Tough" glass pipe was chosen. None proved practical. PYREX pipe was ideal because of its transparency. Operators can watch flow at all times at any point in the line. If stoppage occurs, it can be instantly detected.

Proof of satisfaction

A second even more extensive PYREX pipe system has been installed to transfer cherries from inside barrel storage to initial processing. Six hundred feet long, the new line carries cherries in 3-inch pipe from one end of the plant to the other. A parallel line acts as a return for the storage solution.

Other PYREX installations in this plant handle syrups, flavorings and fruits.

Important advantages for food processors

PYREX *pipe guards product purity.* Its mirror smooth surfaces have no pits or hollows to collect contaminating deposits. Joints are tight with no space between pipe ends to gather sediment.

PYREX *pipe is easily cleaned in place.* A detergent solution followed by water or low pressure steam flushing removes all traces of past contents. Thus it's easy to change over quickly to different products, using the same PYREX lines.

PYREX *pipe's durability* is exceptional, reports Mr. Martin. There has been no breakage and no replacement due to wear, even under operating temperatures of 190° and 200°F. Installation, too, is easy. All of the J. Hungerford Smith PYREX piping is installed by factory maintenance men without special training.

Which do you need most?

Non-corrosion . . . non-contamination . . . visibility . . . ease and speed of cleaning . . . durability . . . economy? You get them all with PYREX pipe.

For detailed information, with pictures and diagrams, mail the coupon below. Or, for answers to your questions on PYREX *pipe applications right in your own factory, contact the Corning Distributor nearest you.*

DISTRIBUTOR LIST:

BELMONT, CALIFORNIA
Glass Engineering Laboratories
FRESNO 17, CALIFORNIA
Valley Foundry & Machine Works
NEW HAVEN, CONNECTICUT
Macalaster Bicknell Company
ATLANTA, GEORGIA
Southern Scientific Company
CHICAGO 44, ILLINOIS
Fred S. Hickey, Inc.
NEW ORLEANS, LOUISIANA
W. H. Curtin & Company
CAMBRIDGE 39, MASS.
Macalaster Bicknell Company
ST. LOUIS 4, MISSOURI
Stemmerich Supply Inc.
LODI, NEW JERSEY
Mooney Brothers Corporation
ALBANY 5, NEW YORK
A. J. Eckert Industrial Sales Corp.
BUFFALO 13, NEW YORK
Buffalo Apparatus Co.
ROCHESTER 3, NEW YORK
Will Corporation
HATBORO, PA.
Sentinel Glass Company
PITTSBURGH 19, PA.
Fisher Scientific Company
HOUSTON 7, TEXAS
W. H. Curtin & Company
SEATTLE 4, WASHINGTON
Scientific Supplies
MONTREAL 3, QUEBEC, CAN.
Fisher Scientific Company, Ltd.
TORONTO, ONTARIO, CAN.
Fisher Scientific Company, Ltd.
VANCOUVER, B. C., CAN. Scientific Supplies

Corning means research in Glass

CORNING GLASS WORKS
DEPT. FE-1, CORNING, N. Y.

Please send me your new PYREX brand "Double-Tough" glass pipe catalog.

Name..... Title.....

Company.....

City..... Zone..... State.....

Use coupon on page 209.

FLO-SWEET ENGINEERS have the longest experience in the liquid sugar industry. From design of a liquid sugar system . . . through operating techniques . . . to finished product quality control—Flo-Sweet's unmatched experience assures satisfaction and economy.

SIX SOUND REASONS

for buying liquid sugar from the leader

1 **ENGINEERING "KNOW-HOW"** amassed over a quarter of a century goes into every Flo-Sweet installation.

2 **EQUIPMENT DESIGNS** for your particular needs are Flo-Sweet contributions to a smoothly functioning liquid sugar system.

3 **LABORATORY RESEARCH** continues to keep Flo-Sweet liquid sugars and handling techniques in the lead.

4 **PRODUCT IMPROVEMENT** has increased quality and cut costs for hundreds of Flo-Sweet users.

5 **PRECISE CONTROLS** of liquid sugar's physical and chemical characteristics are standard Flo-Sweet procedures.

6 **GUIDANCE** in use of regular or special liquid sugars is another Flo-Sweet bonus.

Remember—no other refinery has Flo-Sweet's years of liquid sugar "know-how" . . . all yours for the asking!

A QUARTER CENTURY OF LEADERSHIP

These Flo-Sweet firsts can mean substantial savings for you:

FIRST **to deliver liquid sugar on a bulk commercial basis.**

FIRST **to establish complete engineering service in design and installation of liquid sugar systems.**

FIRST **to formulate liquid sugars tailored to customer specifications.**

FIRST **to develop product quality control through use of liquid sugar.**

FIRST **to devise means of preventing surface dilution of liquid sugar in storage.**

FIRST **to develop effective means of controlling the temperature of liquid sugar going into production.**

Flo-Sweet engineers constantly strive to make Flo-Sweet liquid sugars of greater and still greater value. They will be able to help you. Why not consult them?

flo-sweet

first in liquid sugar

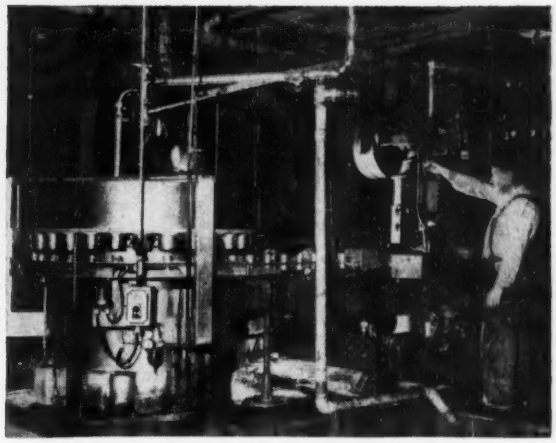
MADE ONLY BY

REFINED SYRUPS & SUGARS, INC.

YONKERS 1, N. Y.

SERVING INDUSTRIAL SUGAR USERS EXCLUSIVELY

WASHED TOMATOES are elevated to sorting conveyors comprising rollers that turn fruit to expose all sides so inspectors can remove defectives.



NEW 30-valve unit fills 450 cans (6-oz.) with juice per minute. Speed of closer is synchronized with filler by drive under can-transfer line.

processed. Losses were sometimes incurred by the inability to process both products simultaneously.

In addition, revision of processing lines—in which heavy equipment used for one product is laboriously removed and that for the new product substituted—is a costly operation. Formerly, these lines had to be changed over at least five times during the short 90-day season in which the plant operates. Costs for such change-overs amounted to considerably more than $100,000, annually.

A detailed study of this operation and its costs (made several years ago) indicated that construction of a new plant, designed and equipped to obviate these change-overs, would prove of economic advantage. This study led to building of the new plant.

Although they are housed in separate buildings, the two plants are essentially an integral part of this canning operation. They are interconnected by systems of stainless steel pipe and can conveyors.

Plant 1 is normally used for processing only tomato juice. Whole tomatoes, puree, catsup, paste, and sauce are made in Plant 2. If an imbalance occurs in Plant 1's preparation lines, or a shut-down of canning equipment becomes necessary, provision is made for diversion of the juice to Plant 2. There are no holding tanks in the juice department.

From tomato dumper-washers to can closers this is a semi-closed system. To protect the product's natural nutritional content, it is sped through this part of the line and is hermetically sealed in cans within 5-min. time.

Bercut-Richards tomato juice is handled and processed under conditions that more than meet the quality standards set by the American Medical Assn. These standards currently require 17.5 mg. of ascorbic acid per 100 cc. of juice. (Formerly this was 20 mg. per 100 cc.).

Fortunately, climatic conditions and the tomato growing season in the Sacramento Valley combine to produce a high quality product. It is reported that this area has the highest solar radiation constant values in the U. S. This alone tends to produce highly colored tomatoes having appreciable amounts of lycopene and carotene—the precursors to vitamin A. The warm growing season also tends to produce tomatoes with high original vitamin C content.

A high percentage of these vitamins are retained because of the techniques and speed with which the raw material is moved from fields and thence through the process.

Juice Process

In the juice plant, tomatoes are removed from the washer by an inclined, bucket-type rubber conveyor. As this unit elevates tomatoes to the second floor, they are rinsed by water sprays. Then, two short conveyors split the flow into transverse streams discharging into another washer. Tomatoes are then elevated to two roller sorting conveyors. Mechanical action of the rollers exposes the entire tomato to the sorters and enables them to easily discern and remove any undesirable fruit, stems, and leaves.

Graded fruit drops from this conveyor into a hopper that feeds the tomato grinder. The latter unit consists of a central enclosed rotor having 12 serrated blades, and a series of vertical, spring-loaded metal shoes. As the tomatoes fall into the aperture between rotor and shoes, which gradually decreases in size to $\frac{1}{8}$ in., the fruit is macerated into a very fine pulp. Approximate rpm. of rotor is 600.

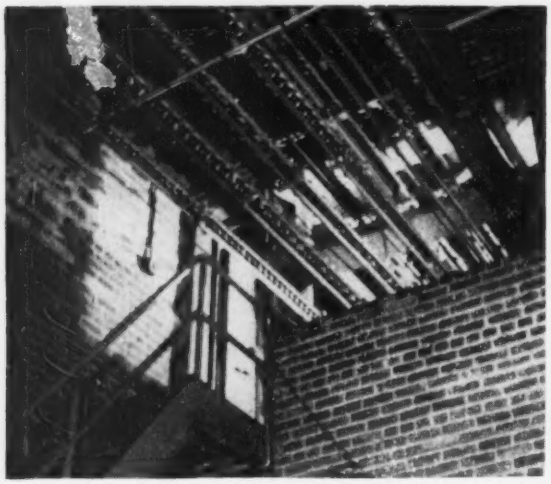
Material now changes from solid to liquid as pulp flows from grinders through a 3-in. stainless pipe to pumps. It is pumped through magnetic separators to remove ferrous metal that may have been included in the raw material, then proceeds to three pre-heaters.

Gives Higher Yield

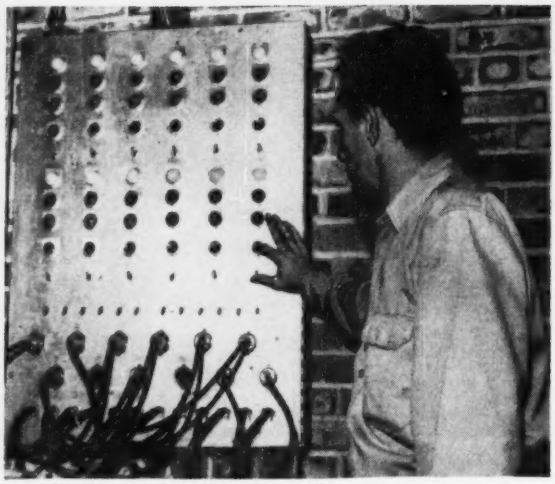
Here, temperature is increased to 190-220 deg. F. to improve efficiency of the next two unit operations—pulping and finishing. Heating permits extraction of a juice with higher pectin content, and better color. It also produces a higher yield per ton of tomatoes. Pectin, which adds body to the juice, is loosened from seeds, and color pigment is released from the skin by this heating. It also serves to reduce toughness of skins and body and it allows pulpers to extract more juice.

Heated product flows to the cylindrical pulpers, where four horizontal heavy metal paddles, operating on an eccentrically mounted central shaft, tend to throw it by centrifugal force, as well as press it against the separating screen. These screens, usually of Monel, form approximately two-thirds of the cylindrical enclosure. Paddles are flared backward at the discharge end of the chamber and, with a propeller action, force out the residue (such as seeds and skins) or pomace, which drops through a chute into a screw conveyor. This pomace is recovered for feed or disposed as waste. Construction and operation of finishers is the same as the pulpers, only difference being that larger screen

How Empty Cans Are Supplied Continuously



NINE conveyor lines (seen top entering 746 ft. long tunnel) move empties from Continental's can-making plant to cannery. They accommodate vari-sized cans.



CONTROL PANEL indicates conditions of can flow. White lights show cables are operating, green that supply of cans is low, red that cans aren't moving.

sizes are used in the latter. Recommended size for pulpers is .060 in. and for the finishers, in tandem with the pulpers, .027 or .033.

Steam operated pumps move juice from finishers, through a stainless pipe system, to the nine can fillers. Each of the latter serves lines in which the product may be filled into cans of different sizes.

30-Valve Juice Filler

Most outstanding unit is the newly installed 30-valve juice filler. Presently there are only three of these high speed (600 cans per min.) units in commercial use. Because of limitations imposed upon it by operating speeds of subsequent machines and capacity of can coolers following cookers, this filler's capacity is restricted to 450 cans (6-oz.) per minute.

Cans are fed by a stabilizing belt, then picked up by a timing worm that moves them into the feeding star. This unit indexes the cans under filler valves and puts them in contact with a no-can no-fill arm, which actuates the air-operated filler valves. Cans ride on a banked track that prevents spillage due to centrifugal force created by their high-speed movement around the filler.

Cans are then conveyed to the continuous, agitating cooker and cooler and thence to labeling and casing machines. The remaining 15 fillers, can closers, and continuous, agitating cookers and coolers are of conventional type. Only two men are needed to operate all 16 cooker-coolers.

Continental Can Co.'s Sacramento factory is located directly across the street from this plant. From it, cans are conveyed on nine lines through a 764 ft. overhead tunnel to the plant (see lead photo). A conservative estimate puts the total length of the complex in-plant can conveying system at more than 5 miles.

To supply a uniform flow of varisized cans under stop-and-go conditions arising in a cannery is not a simple matter. There would be little difficulty if the flow were uniform. However, this is rarely the case. And when the lines slow down, or stop entirely, it is not economical or feasible for can manufacturing to stop. Even a short shut-down may reduce temperature in the body-maker, which could result in defective cans when the machine again begins operation.

In order to surmount these problems, Continental's engineers devised large bins for intermediate storage, along with an electrical indicating control system, operated from a central panel.

This panel is largely an operational warning device. It is operated by switches installed in each of the nine can lines leading through the tunnel. First switches, operating red warning lights, are located about 10 ft. from the entrance of the tunnel. Switch operating the green light is about 50 ft. inside the tunnel.

There are three indicating lights for each can line—white, red, and green. White lights, are actuated by mercury switches, operated by cams on the sides of the sheaves driving each of the nine cable conveyors. When light switches are turned on, white lights flash to indicate that the cables are operating. Switches operating the red (second light) and the green (third light) close when no cans are passing through these points.

A flashing white and a steady red light indicate that cans are not moving on this line from factory to tunnel. This may mean a jam somewhere between the can making machine and the tunnel. Flashing white and steady green light indicate that supply of cans in this line is becoming dangerously low. In either case, operator of the system immediately investigates to find the cause and remedy it.

Wires at the base of the panel are permanently connected to factory can lines and may be plugged into jacks corresponding with the numbers of the lines running into the tunnel.

Each line is equipped with a Productometer—automatic can counter. It operates by an escapement mechanism, counting and recording each can going through it. In addition, a cannery employee constantly patrols the tunnel to obviate conveyor jams and so keep cans moving into the plant. His beat begins at the point where the green light switches are located and ends where the tunnel enters the cannery.

Length of can conveyors in the tunnel serves as a reservoir. No other in-plant can storages are necessary.

Other Products

First three unit operations in the tomato products line in Plant 2—washing, elevating, and sorting—are identical with those of the juice line. From the sorting conveyors tomatoes move through a scalder. A hot water blanch is used in this unit to loosen skins so subsequent operators may

(*Turn to page 144*)

FOR

50 years

1904 - 1954

Wm. J. Stange Co.

"Silent Partners in Famous Foods"®

WM. J. STANGE CO. • CHICAGO 12, ILLINOIS • OAKLAND 21, CALIFORNIA

CANADA: STANGE-PEMBERTON, LTD. • NEW TORONTO, ONTARIO

C.O.S. SEASONINGS • PEACOCK BRAND CERTIFIED FOOD COLOR • N.D.G.A. ANTIOXIDANT

only STONE with MULTI-TONE

BRINGS FULLTONE AND COLOR TO CORRUGATED PACKAGING...

ADDING THE 3D DIMENSION TO PACKAGING

MULTI-TONE now makes possible the reproduction of photographic illustration with full true-to-life detail and color. This added new dimension gives you the opportunity to fully exploit the advertising and merchandising possibilities of your product on your shipping container.

Write for our stimulating brochure suggesting **MULTI-TONE** uses. Also available at no obligation for your showing, a 3 dimensional full color movie, **"Packaging in the 3rd Dimension by Stone."**

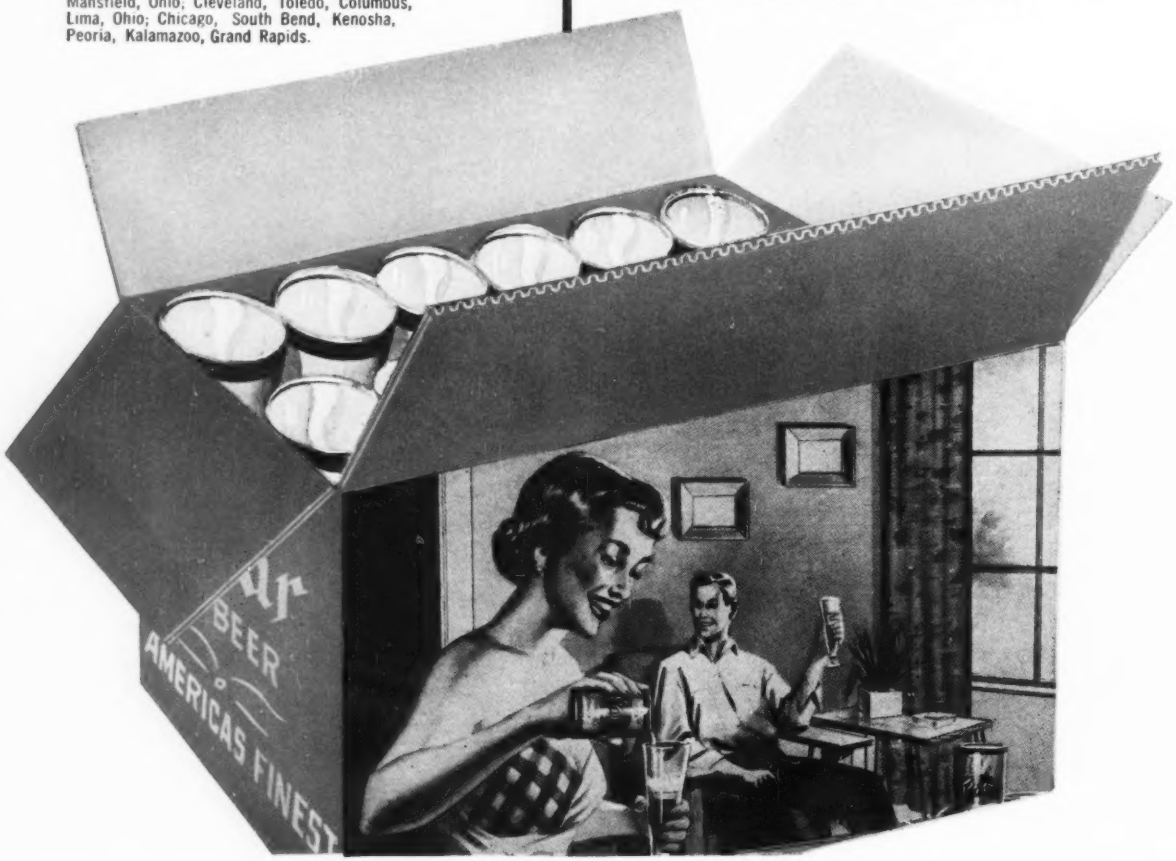
TO SELL AS YOU SHIP!

STONE CONTAINER CORPORATION General Offices: Dept. F 3 • 4200 W. 42nd Pl. • Chicago 32, Ill.

OTHER PLANTS and MILLS: Chicago, Ill.; Philadelphia, Pa.; Franklin, Ohio; Coshocton, Ohio; Pittsburgh, Pa., Mansfield, Ohio, Mobile, Ala.

SALES OFFICES:
New York, Philadelphia, Pittsburgh, Allentown, Pa., Lancaster, Pa., Reading, Pa., Cambridge, Md; Mansfield, Ohio; Cleveland, Toledo, Columbus, Lima, Ohio; Chicago, South Bend, Kenosha, Peoria, Kalamazoo, Grand Rapids.

IN THE MID-WEST CALL
Chicago. Virginia 7-3300 • **Mansfield, Ohio:** Mansfield 4-1116
Pittsburgh: SPaulding 1-4900 • **Cleveland:** Superior 1-5135

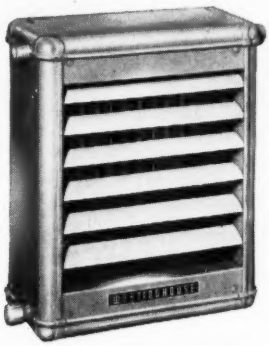


Spot Heating?

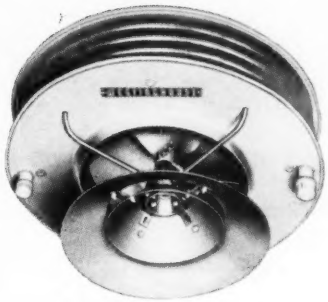
Complete System?

GET ALL 7 UNIT HEATING ECONOMIES

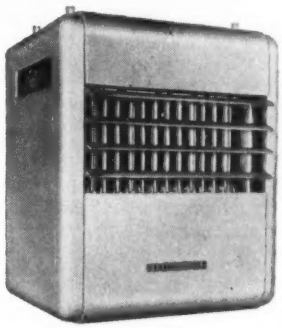
WITH Westinghouse SPEEDHEATERS®



HORIZONTAL SPEEDHEATER
Get 7 to 8 times the output of conventional radiators. 11 standard sizes available for steam or hot water. Capacities from 17,800 to 300,500 BTUH.



DOWNBLAST SPEEDHEATER
(with Multiple Cone Diffuser)
Delivers heat into working areas. 12 standard sizes for steam or hot water. Capacities from 25,000 to 400,000 BTUH.



GAS-FIRED SPEEDHEATER
Will run on low-cost natural, manufactured or LP gas. 7 standard sizes with capacities from 25,000 to 200,000 BTUH. Units have seal of approval of AGA Testing Laboratory.

TO ANSWER ANY UNIT HEATING PROBLEM, ONLY THE COMPLETE WESTINGHOUSE LINE GIVES YOU ALL THESE DOLLAR-SAVING ADVANTAGES:

1. **Instant, Low-Cost Heat**—where and when you want it without long, costly warm-up periods.
2. **Easy Installation**—all models equipped for simple hanger mounting. Minimum piping gives quick fit in tight spots.
3. **Any Application**—wide range of heating capacities—comfort or process—for spot heat or complete systems.
4. **Dependability**—heavy gauge, welded steel construction gives years of service under the toughest conditions.
5. **Design Efficiency**—adjustable louvres direct heat to working area, provide flexible heat distribution pattern.
6. **Quiet Operation**—efficient fan design gives top performance at low sound level.
7. **Dependable Westinghouse Motors**—Replacement motors available on exchange basis from Westinghouse stocking points across the country.

For full details on the Speedheater model best suited to your needs, call your nearest Westinghouse office for Catalogs 1521 (Steam and Hot Water) and 1525 (Gas-Fired), or write Westinghouse Electric Corp., Sturtevant Division, Boston 36, Mass.

WESTINGHOUSE SPEEDHEATERS

YOU CAN BE SURE...IF IT'S Westinghouse

J-80342

Dual Tomato Cannery—How It "Ticks"

Coordinated Mechanical Units Win High Output and Efficiency

TOP-PERFORMANCE materials handling, highly mechanized and integrated, marks the receiving of incoming raw materials at this double-action tomato cannery of Bercut-Richards Co., Sacramento, Calif. Juice is produced and canned in Plant 1, tomato products in Plant 2.

Incoming fruit arrives in lug boxes. These are handled by fork lift trucks—(1) on accompanying flowsheet—and semi-automatic box dumpers (2). Receipts of 82,000 boxes have been recorded in a single day. That's nearly 4,000,000 lb. of raw material! Empty boxes move automatically from the dumpers via belt conveyors to truck exit yards on highway.

From the dumpers, fruit goes first to washers and then on to sorting roller-conveyors. These operations are common to both Plants 1 and 2.

In Plant 1 (the juice line), sorted fruit next passes to grinders. These units change the physical characteristics of the tomato from that of a solid to a liquid-solid. In this state, the material next passes through magnetic pipeline traps and on to stainless steel, sanitary type pumps that move it to vacuum type preheaters—keyed photo [A].

When operating at normal capacity, these preheaters have a vacuum of 3 in. in the steam jackets. The vacuum type units provide more rapid heat transfer and greater accuracy in temperature control. These heaters are also equipped with automatic controls that shut off the vacuum should a product overload occur. This control system prevents burning-on the tubes.

FOR STORY BEHIND LINES turn to this month's revealing article: "Top-Notch Tomato Operation." (p. 77).

Preheating facilitates pulping and finishing, the succeeding operations. Pulpers (11) and finishers (12) both operate on the same mechanical principle—that of forcing material through screens of proper mesh and discarding seeds and peels through the waste exits. Screen openings in pulpers are the larger since these units precede the finishers.

Juice from the finishers is the final raw product, ready to can, on the juice line. Steam pumps move the juice from finishers to a 30-valve filler [B] and the other fillers serving the many can lines.

Filled, closed cans then move on conveyors into the continuous cookers and coolers [D] (FE Feb. '53, p. 76).

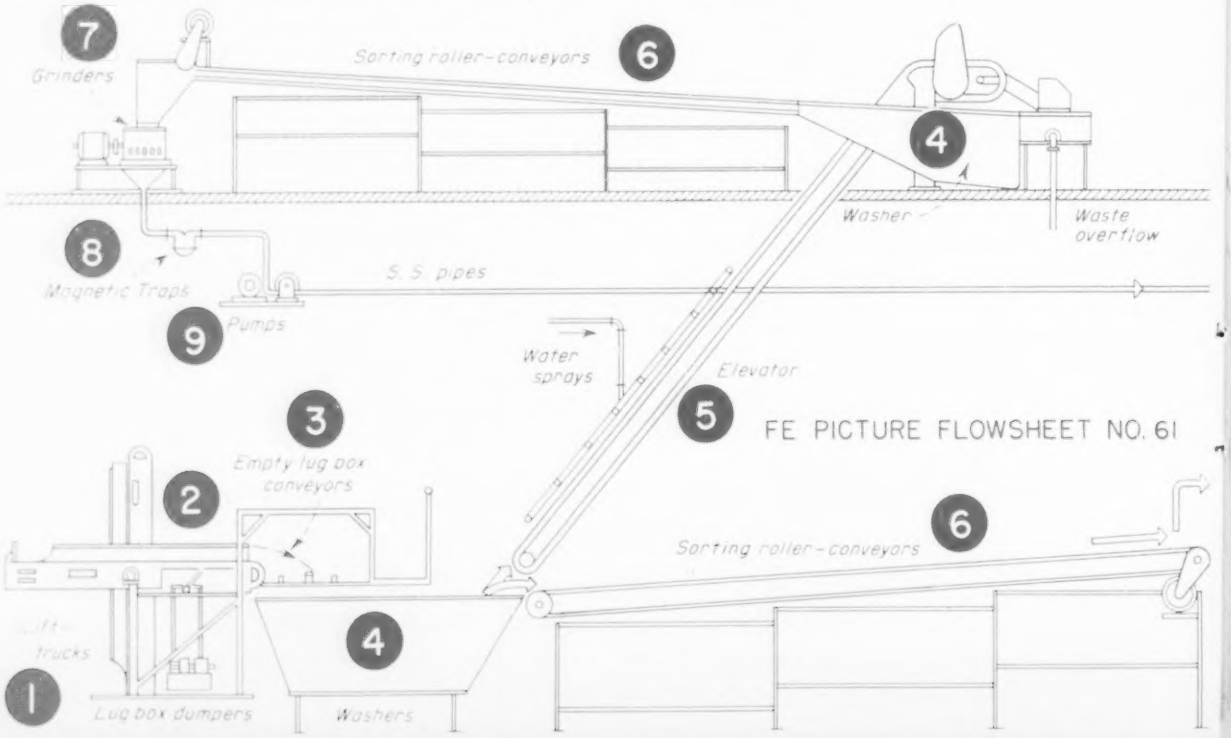
Cans streaming from the coolers are carried on conveyor lines to automatic labelers and casers. Cased finished products move to warehouse either by belt conveyor or tractor-trailer trains.

Returning to the flow in Plant 2 (tomato products line), washed tomatoes from the sorting roller-conveyors (4), are next moved to scalders. These are conventional units used for the so-called "hot-break" in which the fruit is exposed to a hot water blanch that loosens the skins permitting them to be slipped off by operators stationed at the sorting-filling belt (19).

Can systems employed in this plant also comprise conventional units. They offer efficiencies in labor savings and in addition automatically mark cans with product-grade symbols. A merry-go-round type conveyor provides a constant supply of cans to the grading and packing operators. Filled cans are carried on conveyors to seamers. Sealed cans move on conveyors to continuous cookers and coolers. Cooled cans are automatically labeled and cased.

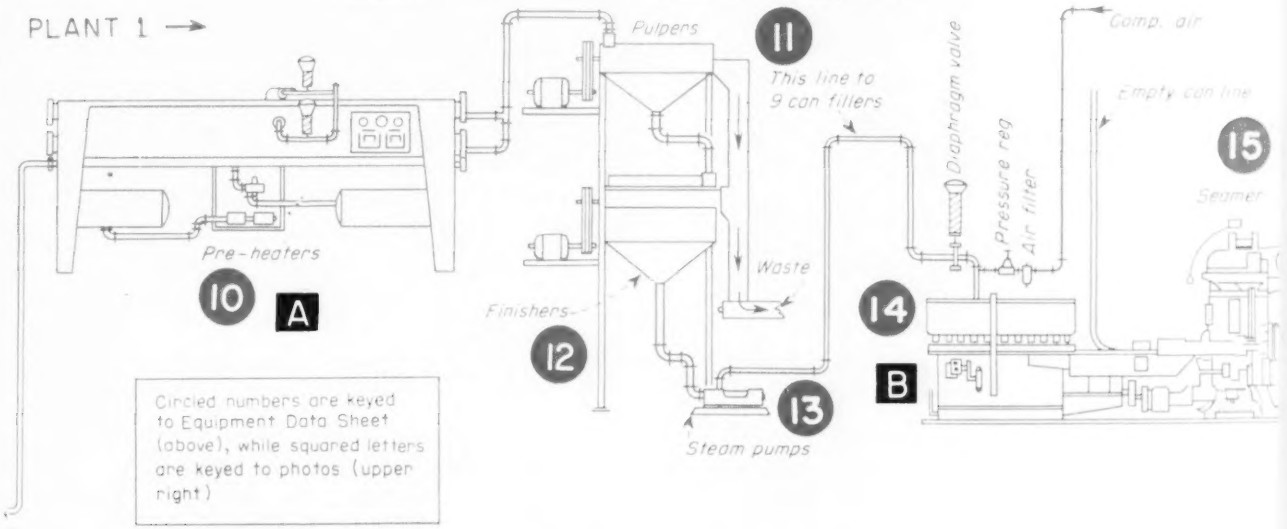
Again back to the grading-packing conveyor (19): Tomatoes from this belt are delivered to grinders. Ground product passes through magnetic traps and is pumped to preheaters. From here, product is delivered to pulpers and finishers. This finished raw juice is then pumped into a 2-stage vacuum evaporator and is concentrated.

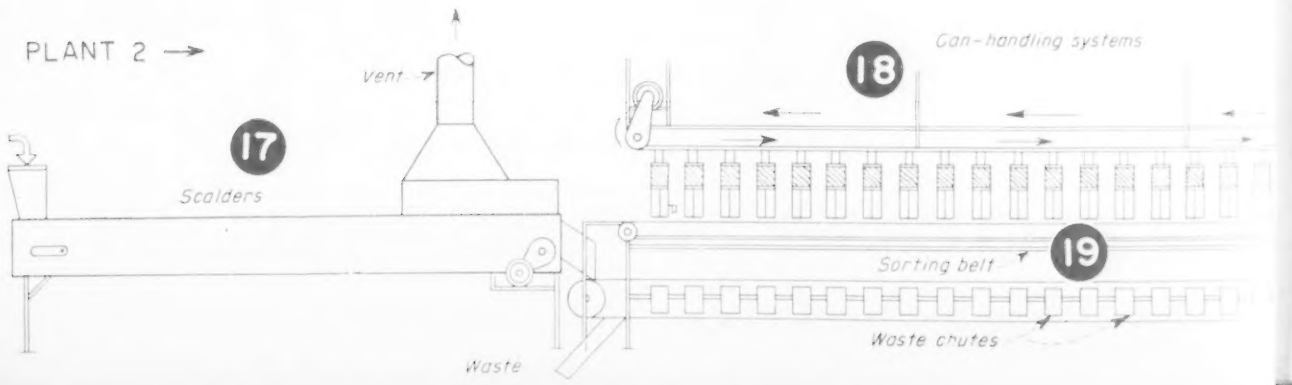
From the evaporator, the thickened product is then pumped to intermediate holding tanks for feeding to the fillers, closers, continuous cookers and coolers on the main floor below. Finished cans are cased and moved to the warehouse for shipment.

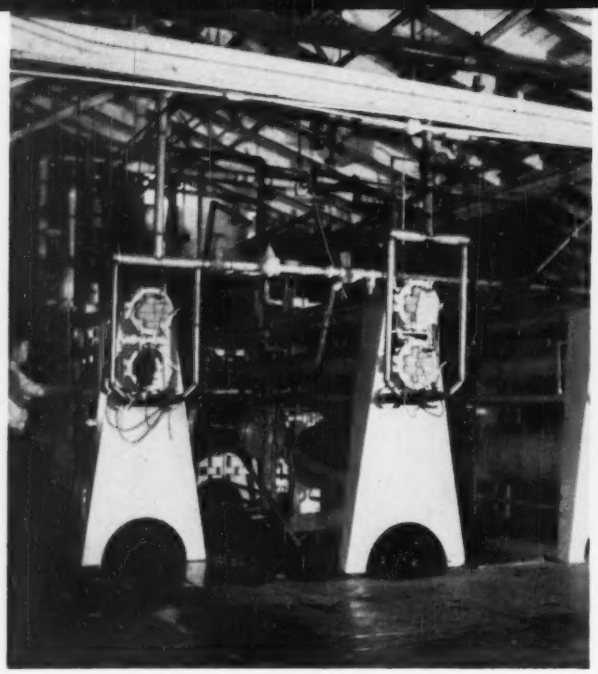


Equipment Data Sheet

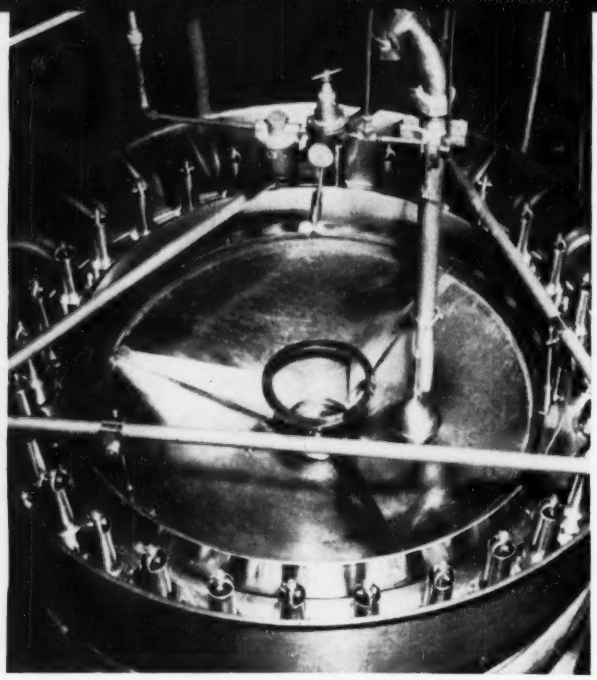
Unit No.	No. of Units In Plants 1	2	Description of Units (BR indicates Bercut-Richards)	Rated Max. Capacities	Total Max. Cap. All Units	Planned Max. Line Balance (20 Hr. Operation)	Elec. Hp. Each Unit	Total Elec. Hp. All Units
1		27	Fork, lift, and tug trucks					
			3 Fork trucks, Clark	4,000 Lb.				
			4 Fork transporters, Yale	3,500 Lb.				
			15 Fork lift, Yale	3,500 Lb.	82,000 Box/Day	75,000 Box/Day		
			2 Fork lift, Automatic	3,500 Lb.				
			1 Fork lift, McDonald	3,500 Lb.				
			2 Case tugs (tractor-trailer trains)					
2	2	4	Lug box dumpers					
			2, FM Corp	2,000 Box/Hr.	4,000 Box/Hr.	75,000 Box/Day		
			4, Benner & Nawman Co	1,800 Box/Hr.	7,200 Box/Hr.			
3			Lug box conveyors, 2 BR	75,000 MT Lug/Day				
4	2	4	Tomato washers, BR	47 Ton/Hr.	47 Ton/Hr.+	47 Tons/Hr.		
5	2	...	Tomato elevators, BR	47 Ton/Hr.	47 Ton/Hr.+	47 Tons/Hr.	3 Hp.	6 Hp.
6	2	4	Sorting roller conveyors, BR	47 Ton/Hr.	47 Ton/Hr.+	47 Tons/Hr.	3 Hp.	18 Hp.
7	2	6	Tomato grinders, BR	47 Ton/Hr.	47 Ton/Hr.+	47 Tons/Hr.	5 Hp.	40 Hp.
8	4	8	Magnetic traps (3 in.), Cesco	47 Ton/Hr.	47 Ton/Hr.+	47 Tons/Hr.		
9	4	9	Pumps, Waukesha	47 Ton/Hr.	47 Ton/Hr.+	47 Tons/Hr.	5 Hp.	65 Hp.
10	3	3	Pre-heaters, Chisholm-Ryder	75 Gpm.	225 Gpm.	13,500 Gph.	1 Hp.	6 Hp.
11	3	3	Pulpers, FM Corp	75 Gpm.	225 Gpm.	13,500 Gph.	20 Hp.	120 Hp.
12	3	3	Finishers, FM Corp	75 Gpm.	225 Gpm.	13,500 Gph.	20 Hp.	120 Hp.
13	2	1	Steam pumps (3 in.), Worthington					
14		16	Can fillers					
	1	...	30-valve, 6 Oz., Fil.-Mor., FM Corp	600 Cpm.	450 Cpm.	27,000 Cph.	.....	5/6 Hp.
	8	7	Additional fillers (#2½ cans)	40–350 Cpm.	Est. 3,000 Cpm.	180,000 Cph.		
15		16	Can closers-seamers, Continental Can Co	40–550 Cpm.	Est. 3,450 Cpm.	207,000 Cph.	5 Hp.	80 Hp.
16	9	7	Cookers-coolers, FM Corp	40–450 Cpm.	Est. 3,450 Cpm.	207,000 Cph.	5 Hp.	80 Hp.
17	...	6	Tomato scalders, BR	47 Tons/Hr.	47 Tons/Hr.+	47 Tons/Hr.	2 Hp.	12 Hp.
18	...	6	Can-handling systems, Albertoli	47 Tons/Hr.	47 Tons/Hr.+	47 Tons/Hr.	½ Hp.	3 Hp.
19	...	6	Grading-packing belts, BR	47 Tons/Hr.	47 Tons/Hr.+	47 Tons/Hr.	2 Hp.	12 Hp.
20	...	...	Product intermediate stge. tank, BR	20 Tons/Hr.	4,600 Gpm.	3,450 Gph.+		
21	...	...	Kettles, BR	20 Tons/Hr.	4,600 Gpm.	3,450 Gph.+		
			Evaporator, Buflovak	20 Tons/Hr.				
22	...	...	1st Effect and steam chest					
22A	...	...	Circulating pump 1,500 Gpm., Steam turbine—42 Bhp.					
23	...	...	2nd Effect					
23A	...	...	Condenser 20 Gpm.					
23B	...	...	Air ejector 2-Stage 450 Lb./Hr.					
24	...	2	Pumps	.....	.....	.....	5 Hp.	10 Hp.
25	...	1	Pump	.....	.....	.....	10 Hp.	10 Hp.
26	...	1	After-Heater					
		4	Control instruments, Taylor					
27	...	...	Supply tanks to fillers, BR					
			3 Boilers (natural-gas fired)					
			2, Babcox-Wilcox Co	500 Boiler Hp.	1,000 Boiler Hp.			
			1, Edgemoor	500 Boiler Hp.	500 Boiler Hp.			





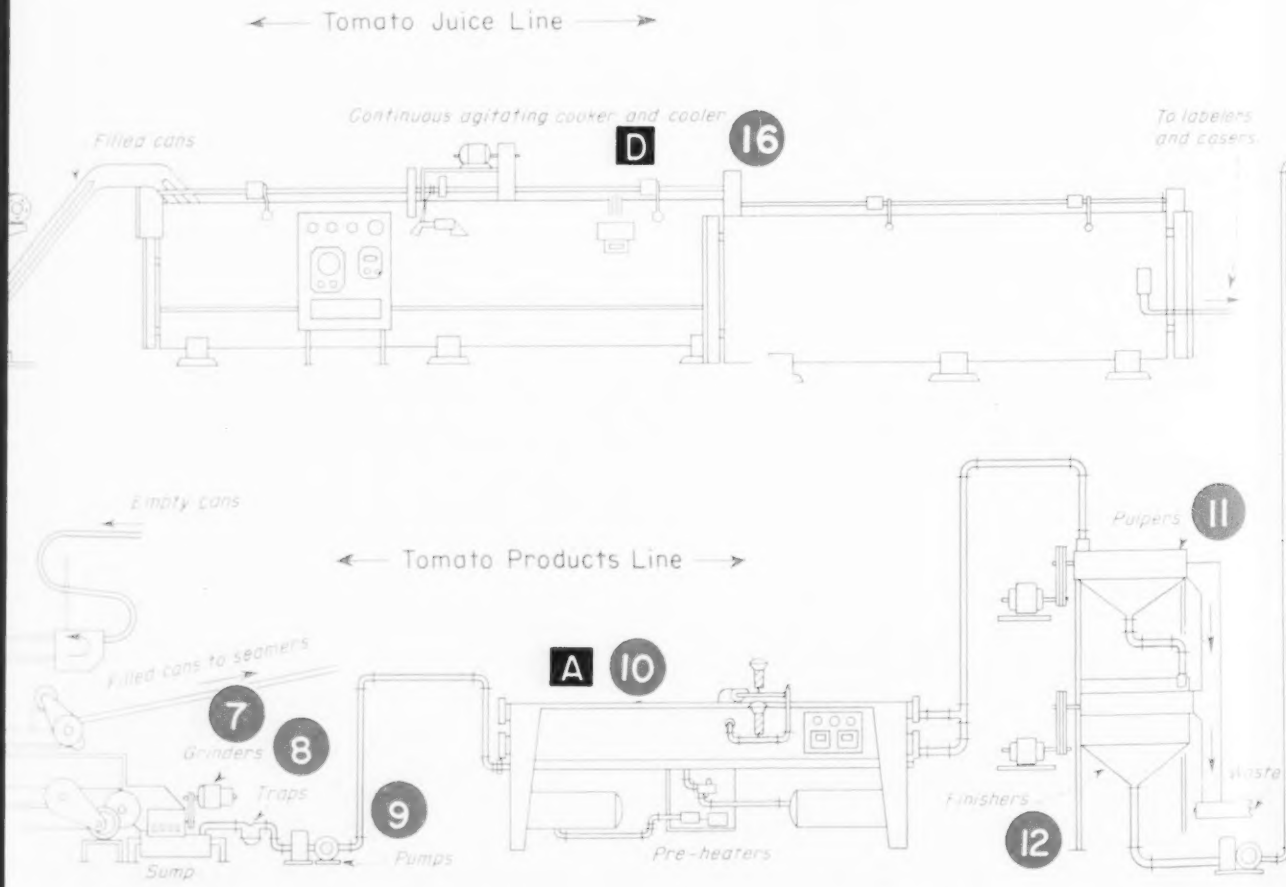


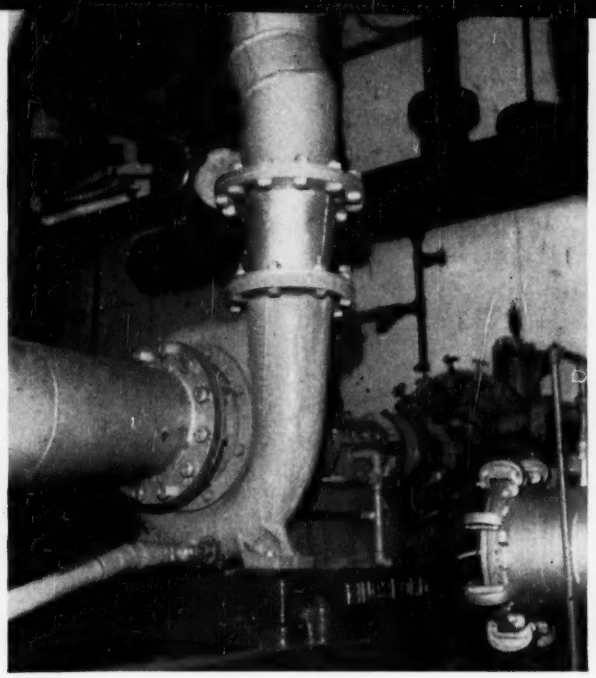
A **THESE** vacuum type preheaters facilitate separation of juice and pomace in the pulpers and finishers.



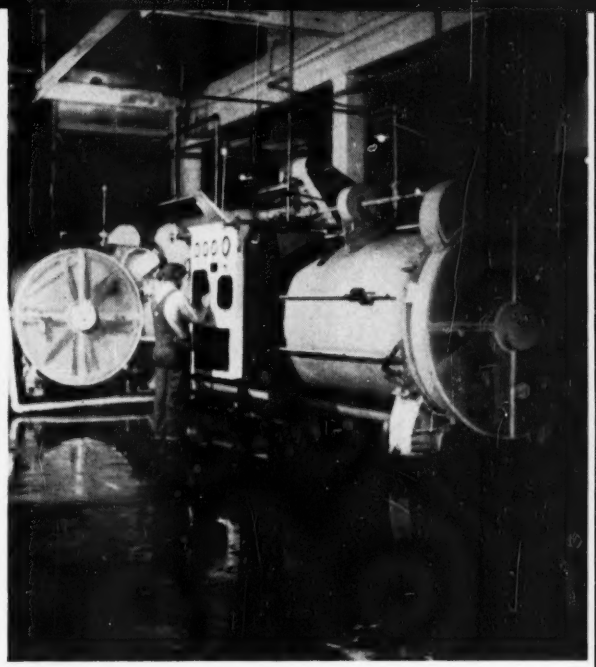
B **BOWL** view of 30-valve filler. Juice reservoir is formed by outer shell and inner weir, valves centered.

FOOD ENGINEERING JANUARY 1954 CANNING SPECIAL Pages 86-89

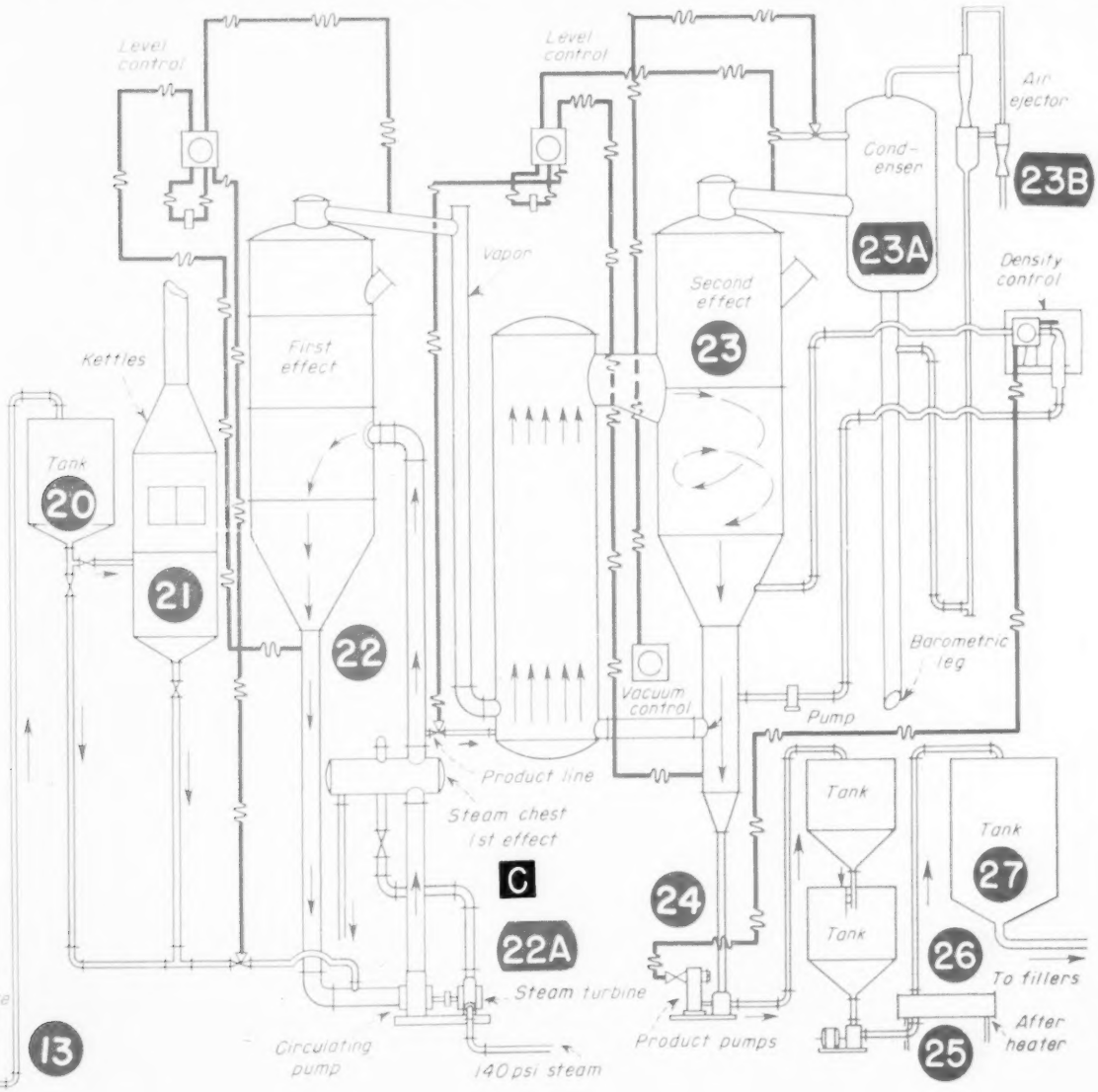




C PRODUCT-circulating pump for 1st effect of 2-stage vacuum evaporator is powered by steam turbine.

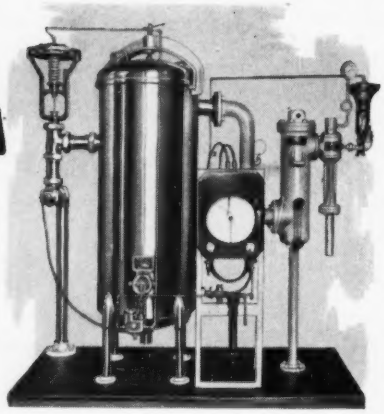


D BOTH juice and tomato products are speedily sterilized in these continuous agitating cookers-coolers.



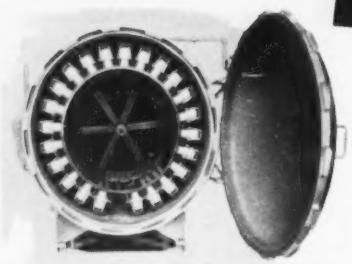
FOR

DEAERATION



Rex Microfilm Deaerators preserve color, flavor, aroma and vitamin content in catsup, tomato and fruit juices, table syrups, baby foods and many other products, more efficiently and at lower costs.

PROCESSING



Rex "patented" Agi-Tort Sterilizers with their end-over-end agitation assure positive, quick heating and cooling of can contents. You get high temperature, short-time processing without danger of scorching, overcooking or undercooking.

CONVEYING

Rex TableTop Chain provides a smooth, steady, tip-free surface for conveying bottles, cans and jars. Rex Carrousel Chains offer the advantages of a chain conveyor that can turn to either side horizontally. An ideal chain for exhaust box or cooling conveyors.

DRIVING

Baldwin Rex Roller Chains provide efficient, positive power transmission for thousands of applications in the food processing, canning and bottling industries. A complete range of standard or special attachments is available for conveyor service.

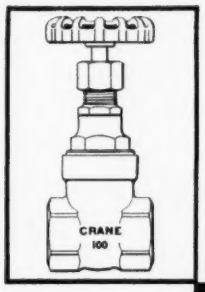
Shafer Self-Aligning Roller Bearings provide the most efficient means of handling heavy loads. Available in pillow block, flange units, take-up units and five other types.

LOOK TO CHAIN BELT COMPANY

SEE THESE COST-CUTTING PRODUCTS at the Canning Show
Visit our Booths No. C-11 & B-16

Sales Offices and Distributors in all principal cities.

NEW* brass gate valves



No. 410,
100-Pound

No. 438,
125-Pound

by

CRANE

No. 437,
150-Pound

* NEW SHAPE... NEW STRENGTH

for 3 All-Time CRANE favorites

Here are valves that didn't have to be changed . . . because each has long been the best in its class. But Crane found ways of improvement to give you an even better buy for your brass valve dollars.

For example—here is greater strength, greater rigidity, made possible by the new cylindrical upper body . . . the same basic shape as high-pressure steel valves. Here, too, is an improved stuffing box that screws *into* the bonnet—also better stem support to assure truer alignment and minimize wear on the packing.

And not to be overlooked is their clean, modern appearance—a very desirable advantage for all of your "exposed" installations. Sizes ¼ to 3 in. Ask your Crane Representative all about this improved brass valve line next time he calls.

just off the press...
new four-page folder with complete facts including sizes, prices and dimensions. Send for yours today. Ask for Brass Valve Folder AD1944.

THE BETTER QUALITY...BIGGER VALUE LINE...IN BRASS, STEEL, IRON

CRANE VALVES

CRANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas

VALVES · FITTINGS · PIPE · PLUMBING · HEATING

New Dodge "Job-Rated" Trucks...

New! Spectacular low-built lines with pick-up and panel floors as low as 22½ inches from the ground . . . knee-high for loading ease! Lower running boards for easier entry! Lower hood for greater visibility!

New! Great V-8's and thrifty 6's including the most powerful V-8's of all leading trucks . . . with revolutionary hemispherical combustion chamber! Available in 1½-, 2-, 2½-ton . . . standard on 2¾-, 3, 3½-ton!

with new low work-saving design...

New Steering system means easier handling . . . keeps Dodge ahead of the field with sharpest turning of any comparable trucks. More slant to steering wheel post. New power steering available in 4-ton models!

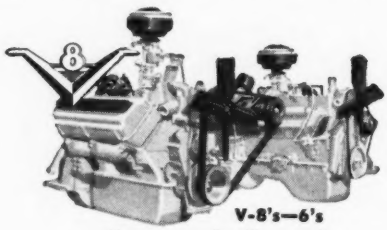
New! Full-vision luxury cabs with big one-piece windshield! More vision area than in any other leading make! New easy-chair seats! New cab sealing against dust, drafts! New two-tone interior styling!

help reduce your trucking costs!

New! Over 75 features! New, low, work-saving, time-saving design! New payload increases! New cab heating and ventilation! New styling from road to roof! New value leader models! New shorter conventional tractors, only 102 inches from front bumper to rear of the cab. New easy-shifting transmissions!

Free book on power! Explains the 3 basic kinds of engine efficiency . . . tells what they mean to you in power and economy! Get your free copy at your friendly Dodge dealer's! See him today!

New! Even greater values...yet still priced with the lowest!



SEE YOUR FRIENDLY DODGE DEALER

NEW DODGE "Job-Rated" TRUCKS

Why is

VANITROPE

the industry's

Fastest Growing

NEW Flavoring Agent?

Because Vanitrope can cut flavor costs up to 50% and improve quality at the same time.

Q. Is Vanitrope now being profitably used by both large and small companies?

A. Yes. Already over 70 companies, ranging in size from America's largest producers of packaged foods down to small plants producing and selling locally, are using Vanitrope to reduce costs and step up flavor.

Q. Is Vanitrope useful in solving the Coumarin problem?

A. Yes. 7 parts Ethyl Vanillin plus 3 parts Vanitrope effectively replaces 32 parts Coumarin. This formula offers the same flavor impact and high temperature baking qualities characteristic of Coumarin.

Q. Is Vanitrope easy to use?

A. Yes. Because it is a pure white crystalline powder, Vanitrope can easily be incorporated in flavor formulae. Since Vanitrope's flavor strength is 16 to 20 times greater than vanillin, we suggest experimenting carefully with it in the first instance. Shulton Technical Service is always available to assist in incorporating it into your formula.

Q. Is Vanitrope available—and stable as to quality and price?

A. Yes. Vanitrope is synthesized in Shulton's modern new plant from always available raw materials. Use of the newest and finest laboratory equipment, including Infra-red Spectro-Photometric inspection, guarantees volume production of unvarying quality.

Samples and brochures available on request.

A DEVELOPMENT OF

SHULTON, Inc.

FINE CHEMICALS DIVISION • 630 FIFTH AVENUE
NEW YORK 20, N. Y.

Use coupon on page 209.

GETTING A HEAD START ON QUALITY!

Mold-Making Skill is a Tradition with BALL

Precision devices constantly test the quality and uniformity of Ball Glass Containers at every stage of manufacture. But in producing the molds which shape your containers, human skill and experience are vital. Ball Brothers take pride in the craftsmanship and know-how of their mold makers, carrying on a tradition of excellence that has made Ball the best known name in glass.

Call Ball first of all for:

Stock or Special Mold Glass Containers... Plain or Lithographed Metal Screw Caps.

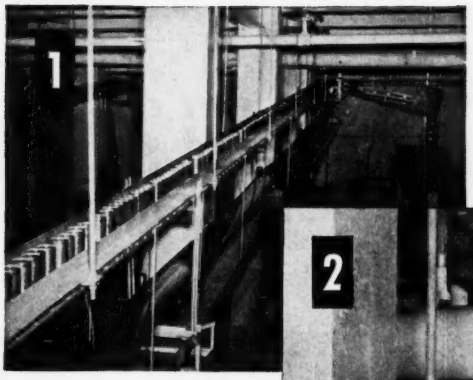
BALL BROTHERS COMPANY • MUNCIE, INDIANA

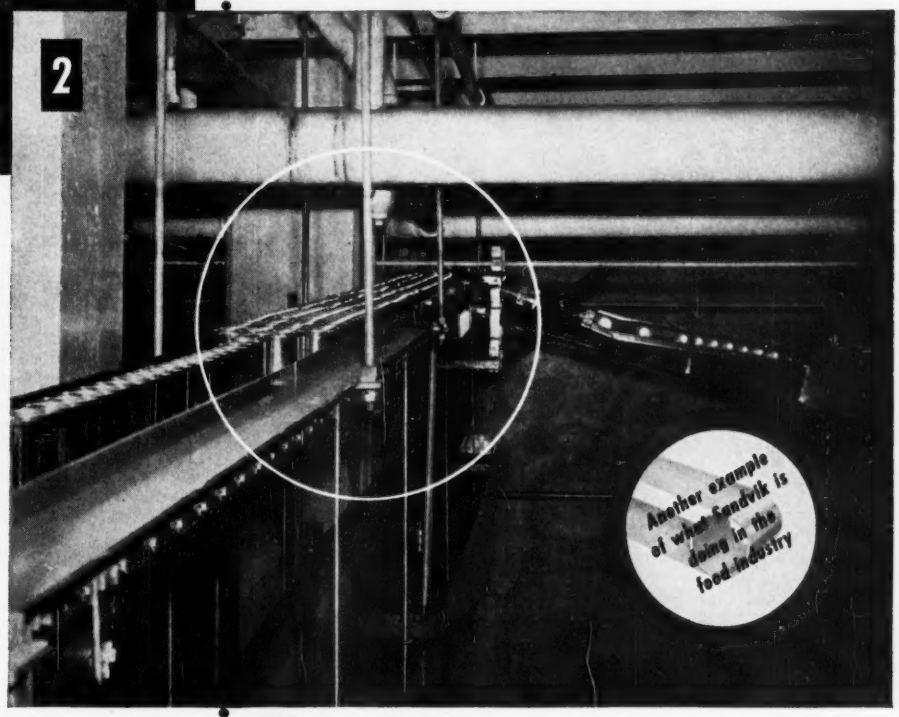
Closure Division: The ARIDOR Company, 3428 W. 48th Place, Chicago 32, Ill.

Offices in All Principal Cities

CALL Ball FOR CONTAINERS, CLOSURES AND PACKAGING ENGINEERING SERVICE

Easier-Sliding Simplifies Can Handling On This SANDVIK STEEL-BELT CONVEYOR





SS-71

Can You Improve Your Food Handling Operation With A Sandvik Steel-Belt Conveyor?

In addition to can conveyors, Sandvik supplies steel-belt units for handling a wide variety of foods, in various stages of preparation. These include meat, fish, vegetables, fruits, sugar, bakery products (on bake oven bands), margarine, candy, etc.

Why not look over your operation. See if there might be a place where the easy-to-keep sterile surface of a solid, stainless or carbon steel band could save money or step up production. Then, ask Sandvik for their engineering help and advice.

Sandvik builds complete conveyors to fit specific applications and provides engineering service to insure satisfactory operation. Belts can be of any length or width.

Write, wire or phone for further information.

SANDVIK STEEL, INC.

Conveyor Division

111 EIGHTH AVE., N.Y. 11, N.Y., WAtkins 9-7180

230 N. Michigan Ave. Chicago 1, Ill. FRanklin 2-5638
Cleveland • Los Angeles

Manufacturers of steel-belt conveyors for over thirty years.

1 Here are cans of Hershey's chocolate syrup carried by a Sandvik steel-belt conveyor. Normally, they move in single file to the take-off point.

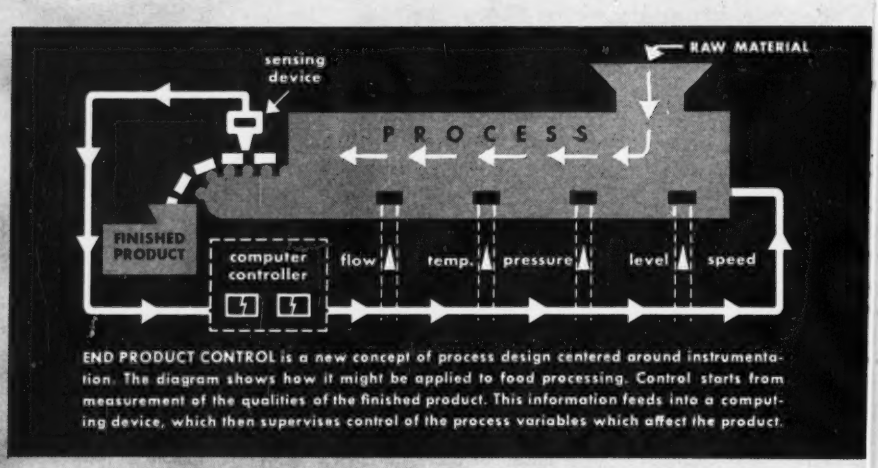
2 But, when there's a delay... the cans keep coming, close ranks, form a column of four and mark time... with the smooth, Sandvik belt sliding easily under them until the take-off operation catches up. At times, there are four can columns, 60 feet long, marking time on the moving belt.

The smooth, low-friction surface of the solid steel band gives a Sandvik conveyor a special advantage for handling cans. They can be very easily slide-handled as they ride on the moving belt. This facilitates automatic storage en route and simple, slide-off discharge at any point with a minimum of belt wear. When extra "slide-ability" is required, the surface of the band can be lubricated.

SANDVIK STEEL BELT CONVEYORS

Use coupon on page 209.

In the food plant



END PRODUCT CONTROL is a new concept of process design centered around instrumentation. The diagram shows how it might be applied to food processing. Control starts from measurement of the qualities of the finished product. This information feeds into a computing device, which then supervises control of the process variables which affect the product.

# of tomorrow–

Honeywell instrumentation will implement new processing techniques

THE RAPIDLY expanding technology of the food industry has already marked notable milestones in processing which help to point the course of the industry's future. And in many of these, instrumentation by Honeywell has played an important part.

The concentration and freezing of citrus juices, aseptic canning, and automatic cream neutralization are but a few of the many examples of developments which advanced instrumentation has helped to make possible. Today, scores of food processes produce more . . . produce better . . . because they are controlled accurately and automatically.

What of tomorrow?

New processes, new plants, new foods . . . all will be aided by the contributions of instrumentation, to an ever-increasing extent. For instrumentation offers limitless possibilities for the food industry . . . possibilities whose surface has yet been hardly scratched.

Today, for example, measurement and control are indirectly related to the product; they deal with temperatures, pressures and other variables which affect the process. Tomorrow may see the growth of Honeywell control systems which taste the flavor of the finished product, inspect its color, feel its texture, or evaluate its bacteriological purity. These systems, which may involve wholly new concepts of instrumentation, could then regulate the food processing equipment so as to produce the desired measured qualities in the end product.

This is but one facet of the role of instrumentation in the future of food processing. There are countless others . . . bold strokes of imagination today, but solid reality tomorrow . . . which Honeywell will explore in cooperation with forward-looking food technologists.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 4502 Wayne Ave., Philadelphia 44, Pa.

● **REFERENCE DATA: For a challenging discussion of the future role of instrumentation, write for your copy of a paper entitled "How Automatic Can We Get?"**

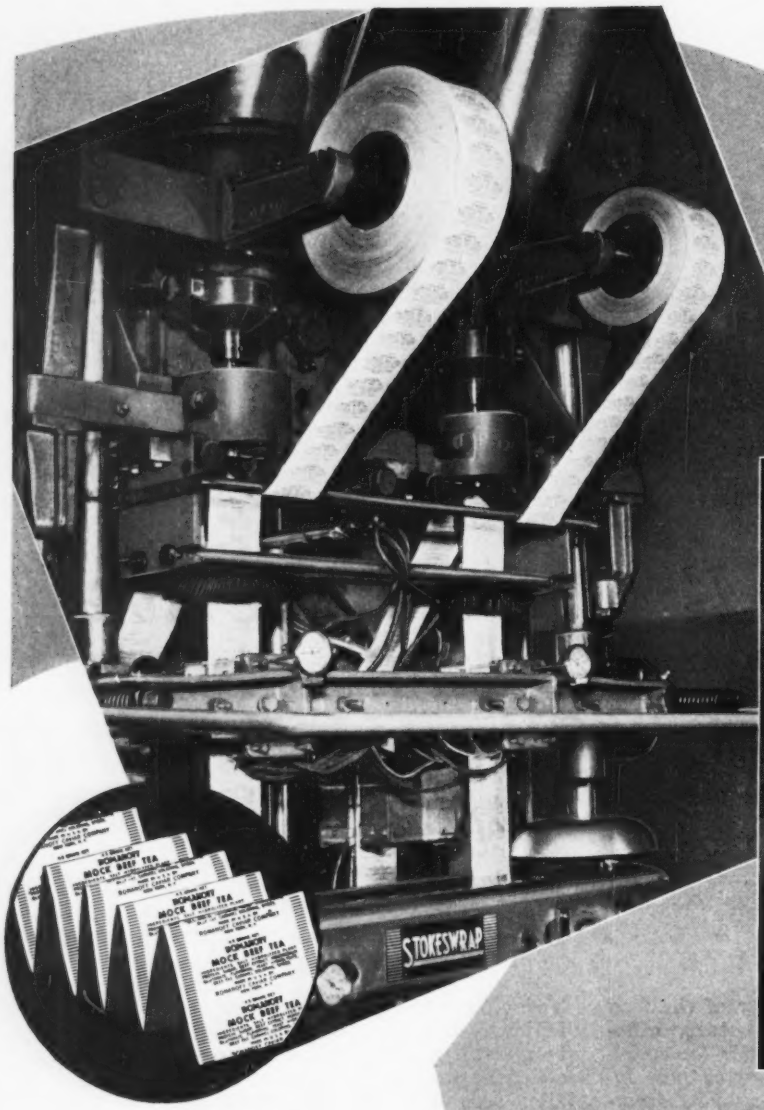
MINNEAPOLIS **Honeywell**

BROWN INSTRUMENTS

First in Controls

Food plant design by The Austin Company anticipates new demands of the future.

Speed Packaging for BIGGER PROFIT!



Stokeswrap machine installation at Romanoff Caviar Company, New York.

To economically keep up with demand, the packets for Romanoff's famous MBT are formed, filled, and sealed on a time-saving STOKESWRAP.

This new hot drink comes in powdered form and is packaged in strip-perforated, laminated foil packets. Neat, exact registration of the printed strip is made possible by the STOKESWRAP'S accurate operation.

The STOKESWRAP is available in two sizes; speed ranges from 50 to 140 packages per minute. Any type of approved heat sealing paper, foil, cellophane or Pliofilm may be handled on a STOKESWRAP.

Write and explain your packaging requirements. Expert engineering counsel is yours without obligation. Bulletin 4956 sent promptly upon request.

Stokeswrap

Increase your Profit Margin with S & S Machines

STOKES & SMITH CO.

4911 SUMMERDALE AVE., PHILADELPHIA 24, PA.

Pacific Coast: SIMPLEX PACKAGING MACHINERY, INC., 534 - 23rd AVE., OAKLAND 6, CALIF.

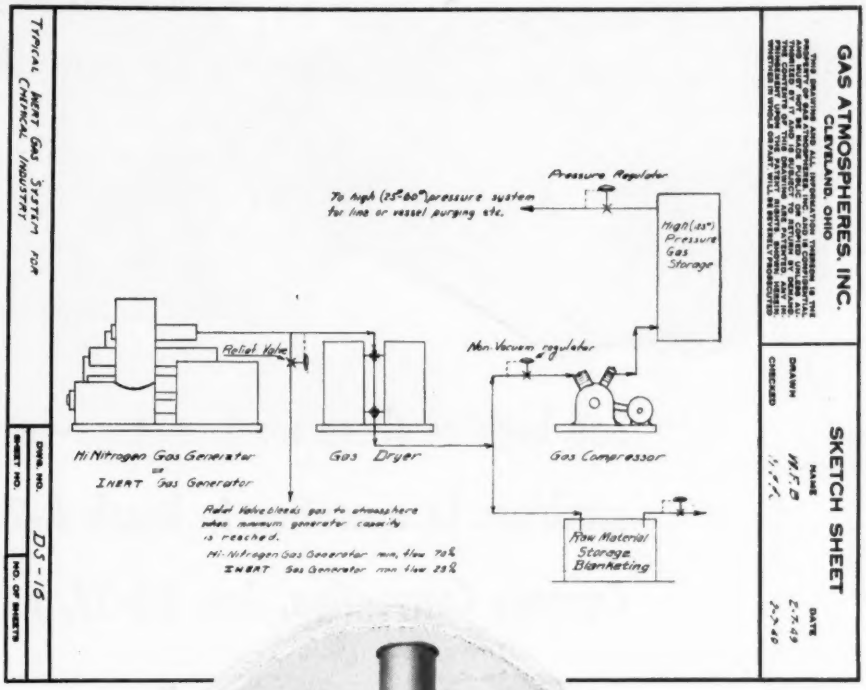
fmc

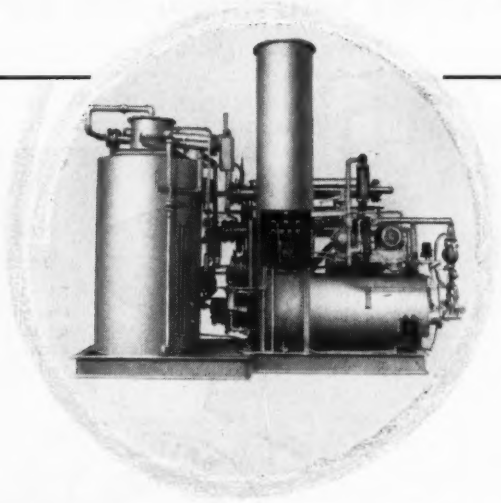
SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION

TRADE MARK

BETTER CANNING BEGINS HERE

More progressive canners every day are turning to inert gas packaging as the surest, most efficient method of modern food canning.


GAS ATMOSPHERES, INC.
CLEVELAND, OHIO
SKETCH SHEET
Typical Inert Gas System for Chemical Industry
Pressure Regulator
To high (25-60#) pressure system for line or vessel purging etc.
High (asr) Pressure Gas Storage
Relief Valve
Man. Vacuum regulator
Hi Nitrogen Gas Generator or INERT Gas Generator
Gas Dryer
Gas Compressor
Relief Valve bleeds gas to atmosphere when maximum generator capacity is reached.
Hi-Nitrogen Gas Generator min. flow 70%
INERT Gas Generator min flow 25%
Raw Material Storage Blanketing
DRAWN
CHECKED
DWG. NO. D5-16
SHEET NO.
NO. OF SHEETS
DATE



The plan and generator shown here are saving thousands of dollars for a leading food canner.* And he reports higher product quality.

*Name furnished on request.

Gas Atmospheres Inc. is one of the leading producers of gas generation and gas purification equipment for the food packaging industry. Regardless of amounts of gas required, Gas Atmosphere engineers and packaging experts can show how you can save the cost of the equipment in the first year by generating your own gas. Fully acquainted with the needs of the food packaging industry, Gas Atmospheres will design a complete, packaged layout tailored to exactly suit your job requirement. Why not talk modern packaging and the application of inert or nitrogen gas with a Gas Atmospheres engineer. There's no obligation. Simply let us hear from you.

gas Atmospheres, inc

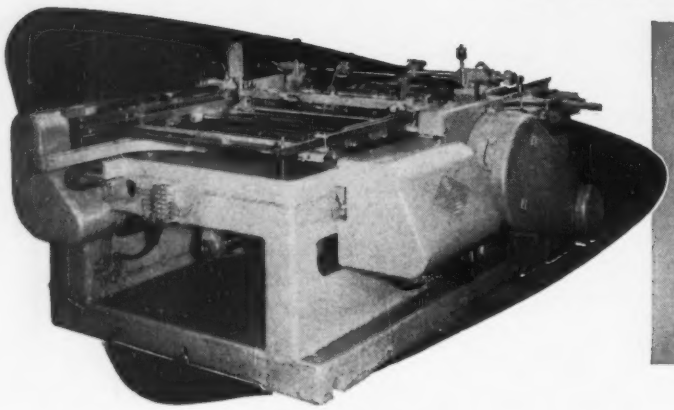
equipment for producing industrial gases

20011 WEST LAKE ROAD CLEVELAND 16, OHIO

rugged, fast, dependable...

HAMILTON

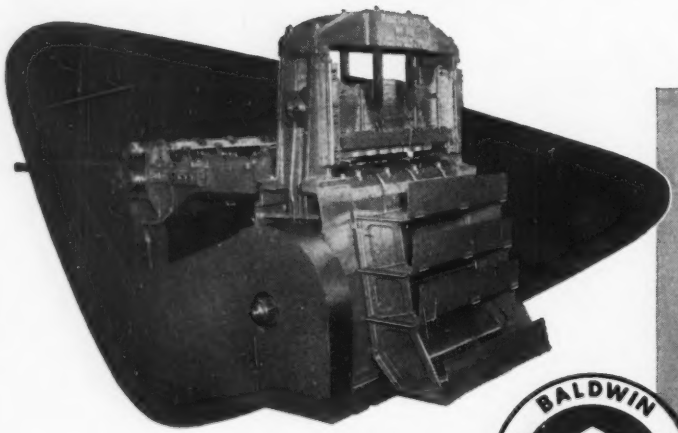
can making machines



HAMILTON
duplex gang trimmer and slitter...

Automatically trims and slits sheets up to 36" at high speeds . . . as fast as 70 sheets a minute . . . newly designed for more efficient, economical operation.

See both of these modern, high-speed machines in operation in Booth A-26, Canners Convention, Jan. 23-27, Atlantic City



HAMILTON
scroll shear . . .

Speeds output, handling sheets 25" to 36" square up to 125 strokes per minute. Cuts costs, saving up to 7% in tinplate.

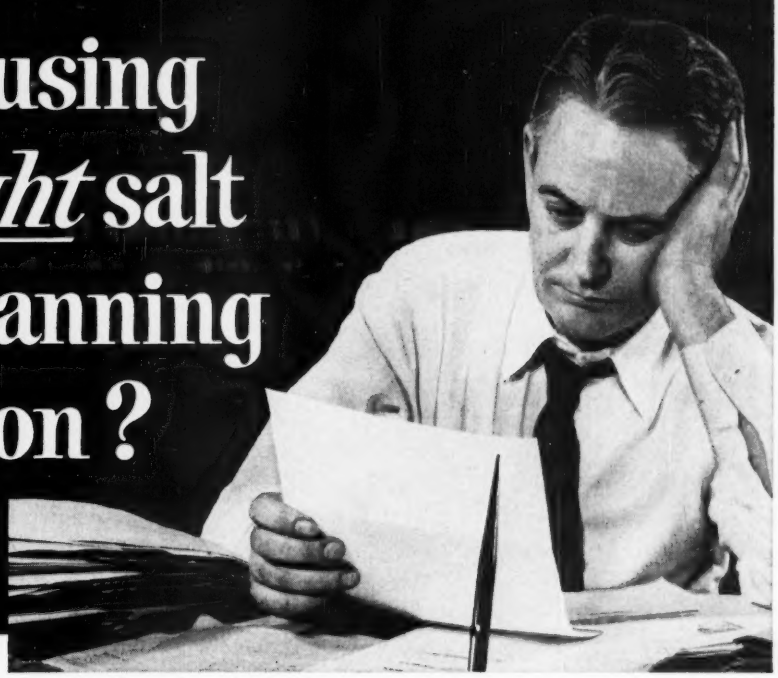
Learn more about how modern machines from the complete Hamilton line can give you faster production at lower unit costs. Write . . .

BALDWIN · BLH · LIMA-HAMILTON

HAMILTON DIVISION
Baldwin-Lima-Hamilton Corporation
Hamilton, Ohio

BALDWIN - LIMA - HAMILTON

Are you using the *right* salt in your canning operation?



The *right* salt—and the *right* salting method—can save you money *and* improve your product.

And that's where Morton's *3-Way Salting Service* can help you plenty!

First,
Morton offers expert advice on the *right* salt and *right* salting method for your operation through its trained staff of Consulting Engineers. On request, a representative will call and analyze your particular requirements . . . with the objective of saving money and improving quality.

Second,
only Morton offers a *complete* line of canning salts —including the *right* salt for your needs, always available at favorable prices and freight rates. This is possible because only Morton has *nine* plants, strategically located to serve you promptly and economically wherever your cannery may be.

Third,
Morton offers three labor-saving salting methods that can cut your costs. The *Salt Tablet Depositor* drops *one* tablet in *each* can at high speed with never-fail accuracy. The *Bulk Salter* meters precise amounts into each can by the economical bulk method. The *Morton Brinemaker* delivers up to 800 gals. of clear, fully saturated brine an hour, piped anywhere in your plant.

Stop and Think!
A thorough, no-obligation study of your salting operation may boost your profits. Better mail the coupon below today!

CLIP AND MAIL COUPON TODAY!

MORTON SALT COMPANY
Industrial Division
Dept. EM-1, 120 S. LaSalle St.
Chicago 3, Illinois

Please send me full details on the Morton Brinemaker. I would also like information on:

☐ Morton Canning Salt ☐ The Bulk Salter ☐ The Salt Tablet Depositor

Name and Title_____

Firm_____

Address_____

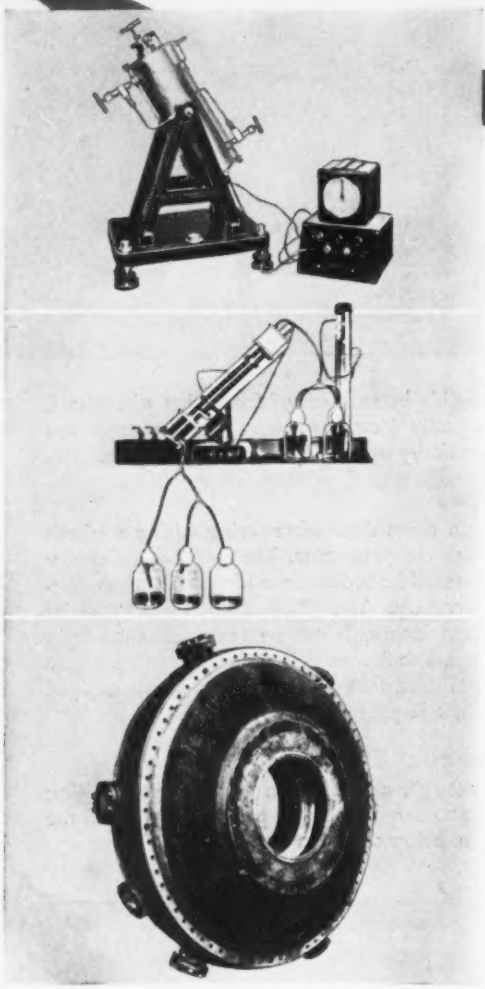
City_____ Zone____ State_____

(Brinemaker not available on West Coast)

From Crude—to Plasma—to MSG

Carpenter Stainless Tubing

Passes All Tests



In the column at the left you see pictured a high pressure Viscosimeter used for field testing in the petroleum industry; a Blood Plasma Sterilizer that speeds processing of that vital fluid; a Calandria used to extract highly corrosive Glutamic Acid in process of making Monosodium Glutamate to add savor to food.

These pieces of equipment have one thing in common—Carpenter Stainless Tubing—and for each one Carpenter tubing was specified for a *different set* of reasons. They included extra smoothness of I.D. and O.D., unusual concentricity, close adherence to published tolerances, good ductility, ease of working and corrosion resistance. One reason, however, was common to all specifications—*unvarying quality*—from piece to piece, order to order.

In short, the manufacturers of these and many other diverse types of processing equipment know that there *is* a difference in stainless tubing—and Carpenter makes that difference. Why not get the cost-saving advantages of Carpenter's all-round service satisfaction the next time you need stainless tubing?

Call your nearest Carpenter representative for prompt service on your requirements *plus* help in solving design, engineering or fabricating problems.

The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

Branch Offices: Atlanta Chicago Pittsburgh Houston Newark San Francisco

Export Dept.: The Carpenter Steel Co., Port Washington, N.Y. "CARSTEELCO"

Carpenter

STAINLESS TUBING & PIPE

Analysis → ← Tolerance → ← Finish

- guaranteed on every shipment

Sorbitol, available in mass production quantities, is derived from corn, cane and beet sugars. You can obtain prompt shipments in tank car, drum or carload lots . . . at exceptionally economical cost.

Food technologists have found that sorbitol imparts improved qualities to many food products, through its ability to extend storage life by stabilizing moisture and retaining softness. The non-volatility and mild, sweet flavor characteristics of sorbitol also contribute to its preference for such use.

Sorbitol has been known for decades as a naturally-occurring, nutritive ingredient of many edible fruits and berries. Two forms are available: SORBO® (70% solution) and crystalline powder or pellets.

We'll be glad to send samples, and to help you investigate the possibilities of utilizing sorbitol in your own food product.

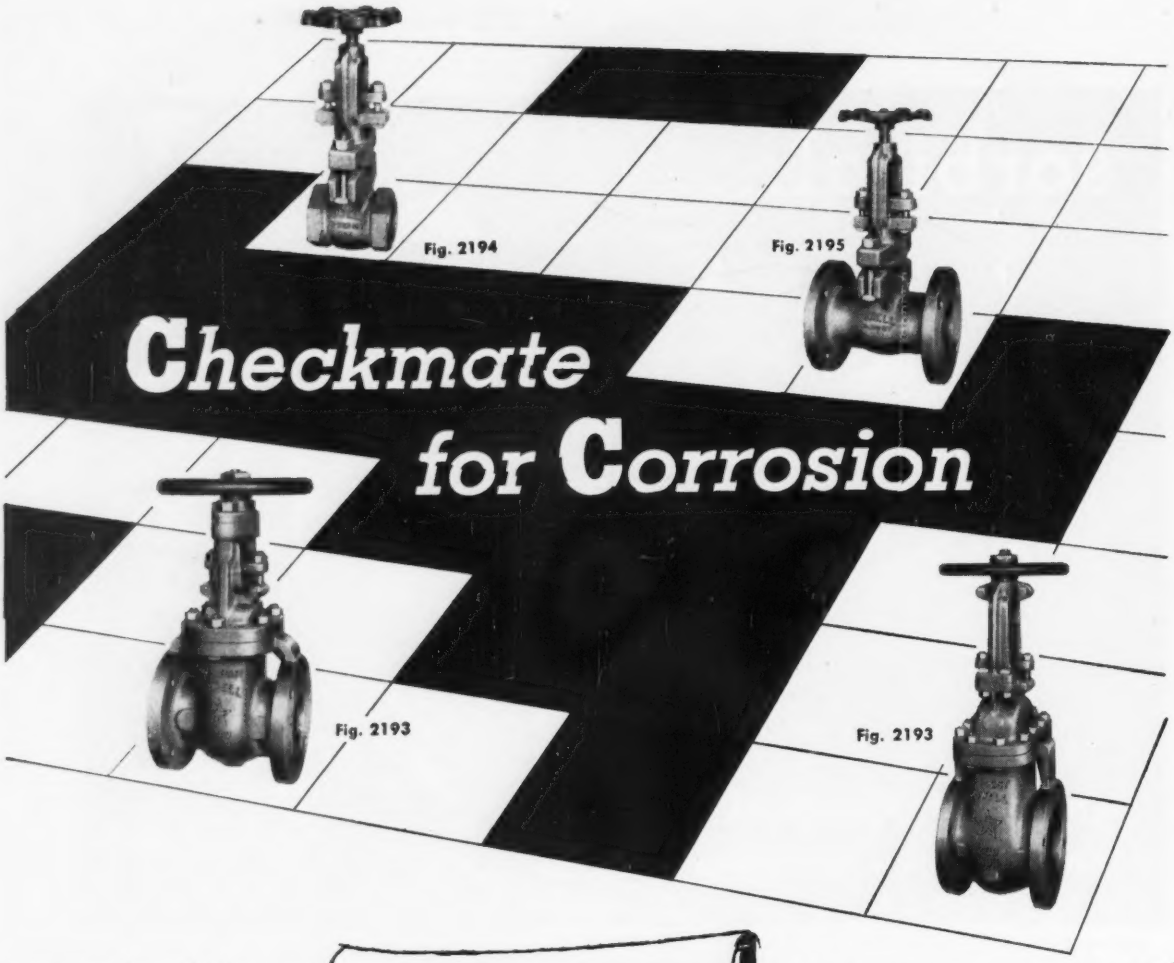
INDUSTRIAL CHEMICALS DEPARTMENT

ATLAS POWDER COMPANY

WILMINGTON 99, DELAWARE

offices in principal cities

ATLAS POWDER COMPANY (CANADA, LTD.)
BRANTFORD, CANADA



GATE VALVE *(upper left)* **Fig. 2194** for 225 pounds W.O.G. Screwed ends, bolted flanged bonnet, inside screw rising stem. Body and bonnet are made of Ni-Resist, with 18-8S Mo Stainless Steel (Type 316) stem, seats, and wedge. Sizes ¼" to 2", inclusive.

GATE VALVE *(upper right)* **Fig. 2195** for 200 pounds W.O.G. Flanged ends, bolted flanged bonnet, inside screw rising stem. Ni-Resist body and bonnet, with stem, seats, and wedge made of 18-8S Mo (Type 316) Stainless Steel. Sizes 1" to 3", inclusive.

GATE VALVE *(lower left)* **Fig. 2193** for 200 pounds W.O.G. Flanged ends, bolted flanged bonnet, outside screw rising stem and one-piece yoke. Body, bonnet, and yoke are Ni-Resist. Stem, seats, and wedge are 18-8S Mo (Type 316) Stainless Steel. Size 4".

LARGE SIZE GATE VALVE *(lower right)* **Fig. 2193,** 5" to 12", inclusive, for 200 pounds W.O.G. Flanged ends, bolted flanged bonnet, outside screw rising stem and two-piece yoke. Ni-Resist body, bonnet, and yoke, with 18-8S Mo (Type 316) Stainless Steel stem, seats and wedge faces.

It's a winning move every time you select Powell *Ni-Resist* Valves. For here is an alloy that has far greater corrosion and heat resistance than ordinary Cast Iron. Similar to gray iron, and resembling austenitic stainless steel in many ways, no other cast metal offers such a unique combination of useful properties.

Powell Ni-Resist Valves are especially adapted for handling pulp and paper mill liquors, oil refinery acids, alkalies and sludges, caustic soda, pickling solutions, sea water and many other fluids. Shown here are just a few of them to help you checkmate the high cost of corrosion. They're available through distributors in principal cities. If a distributor is not located near you, just write us—The William Powell Company, Cincinnati 22, Ohio. We'll be pleased to tell you more about these valves—or to help you with your valve problems. Powell has probably solved more valve problems than any other organization in the world.

CONTROLS FOR THE LIFE LINES OF INDUSTRY

.....108th YEAR

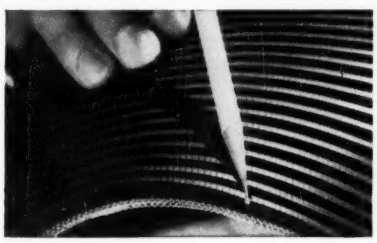
RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

New B. F. Goodrich belt grips better, lasts at least 16% longer

Self-cleaning belt offers many savings, yet costs no more

HERE'S a radically new conveyor belt, called Ribflex, that can carry packages, bags, crates, all sorts of things at angles never possible before and so make important savings in space, equipment, and time.

It's the new flexing rib design that gives this belt its nonslip, gripping action. Parallel ribs of rubber are cross cut into thousands of flexible grip blocks—more than 5,700 to the square foot. The tiny, self-cleaning rubber blocks are tough enough to grip anything carried by the belt, and move it safely, surely.

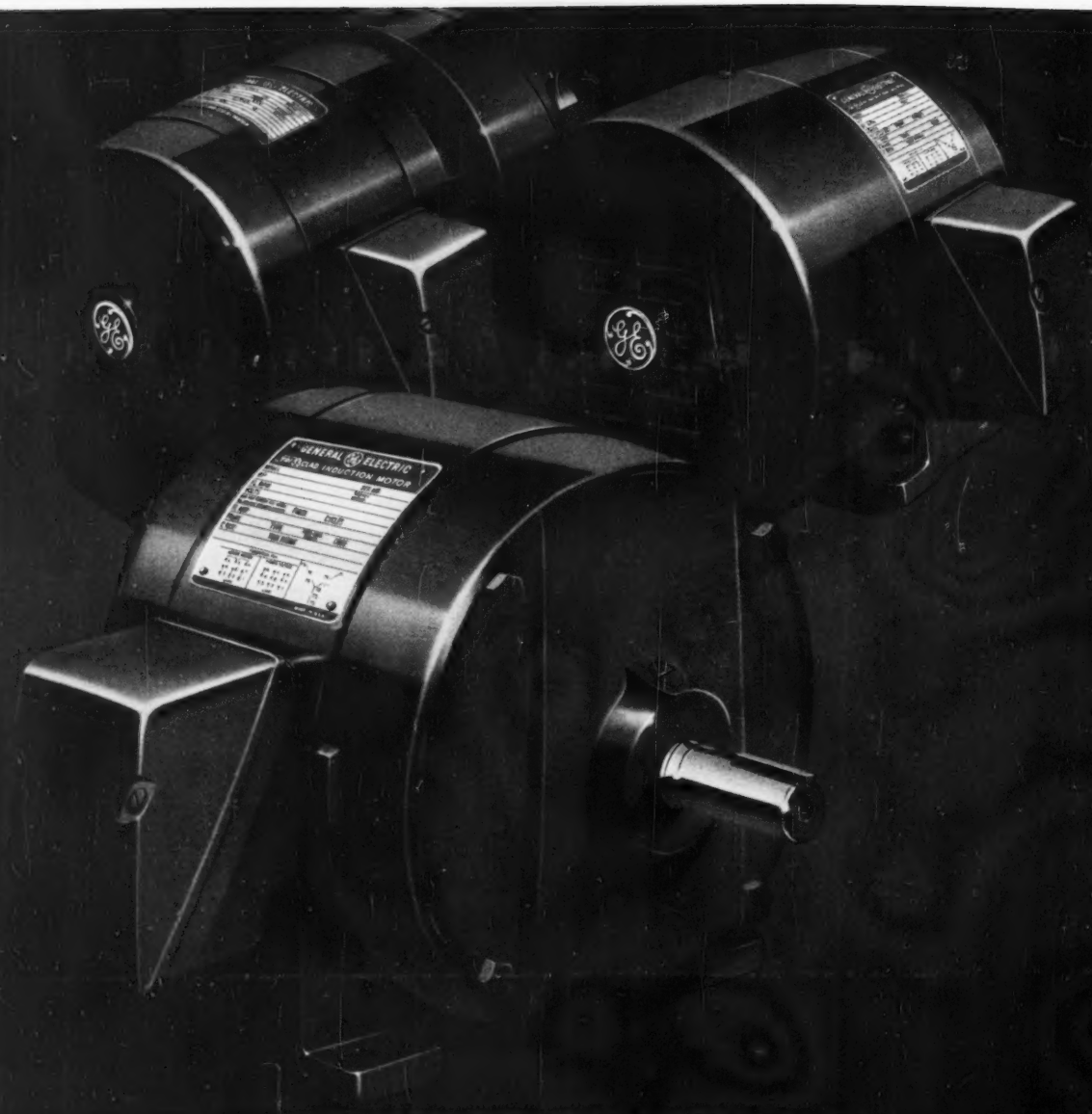


Because of this new design, the Ribflex belt keeps its effective gripping power long after belts with rough, knobby covers become worn and smooth. Tests prove the Ribflex belt will give *at least* 16% longer service life than ordinary rough surface conveyor belts.

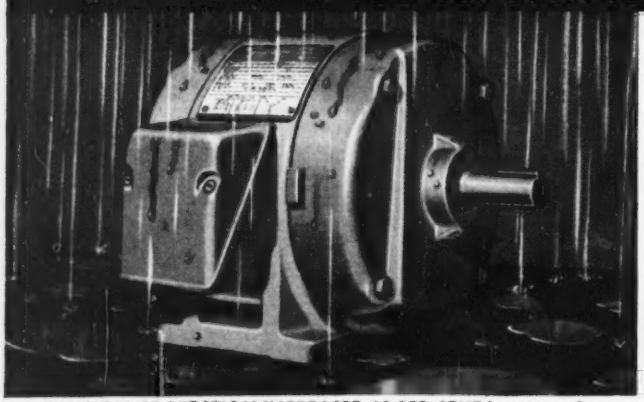
With this improved B. F. Goodrich belt, it's now possible to design installations for higher incline angles and so make substantial savings in conveyor lengths and floor space. For example, just by increasing the incline angle from 30° to 45°, a 29% shorter conveyor can be used, 42% less floor space is needed.

The B. F. Goodrich Ribflex belt is now at work in sugar companies, processing plants, breweries, warehouses and other places where it is making many food handling jobs cheaper, more efficient. Before you buy another replacement belt or design a new installation, let a BFG distributor show you how this unusual belt can cut costs in your plant. Or for further information, write *The B. F. Goodrich Company, Dept. M-145, Akron 18, Ohio.*

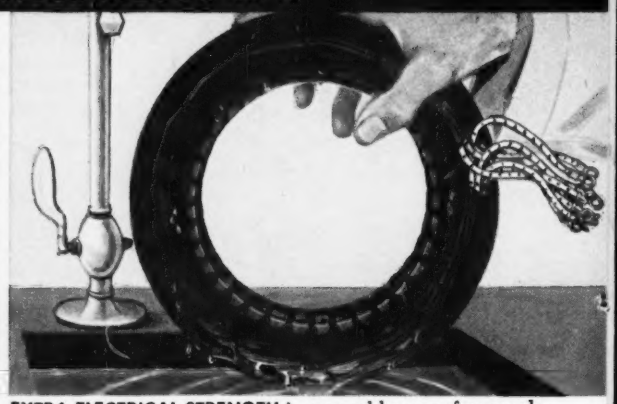
B.F.Goodrich
INDUSTRIAL PRODUCTS DIVISION



YOU GET EVEN LONGER MOTOR LIFE



PHYSICAL PROTECTION INCREASED 60 PER-CENT by a complete redesign of cast-iron frame and end shields. This motor is suitable for many jobs where ordinary dripproof motors should not be applied.



EXTRA ELECTRICAL STRENGTH is assured by use of new polyester film insulation. A silicone coating, Dri-film,* virtually eliminates stator insulation failure caused by moisture.

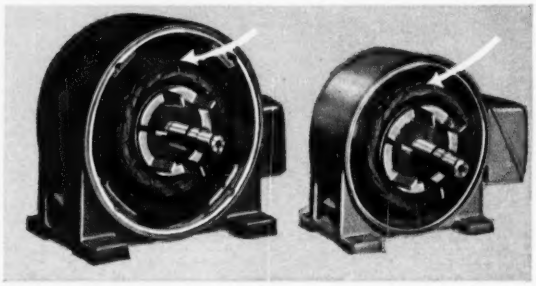
*REG. U.S. PAT. OFF.

TRI 55 CLAD REG. U.S. PAT. OFF. THE LEADER IN MODERN MOTOR DESIGN

GENERAL ELECTRIC ANNOUNCES...

THE ALL-NEW TRI 55 CLAD MOTOR

REG U.S. PAT. OFF.



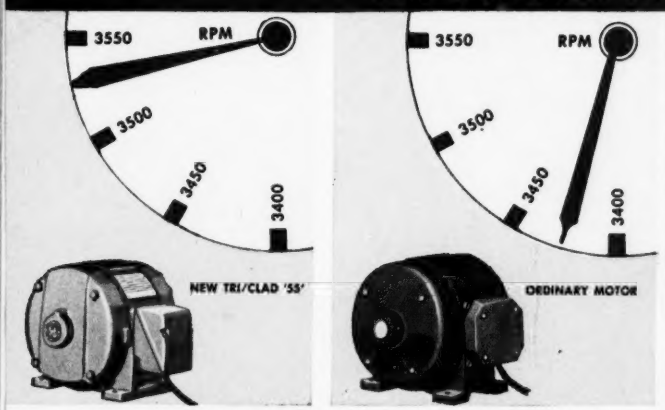
LIGHTER, SMALLER Tri/Clad '55' motors have been made possible through better use of space within the frame. Active materials (magnetic steel, copper) have not been sacrificed.

Complete Line of Dripproof, Enclosed Motors and Gear-Motors Available in Most Ratings in 1954

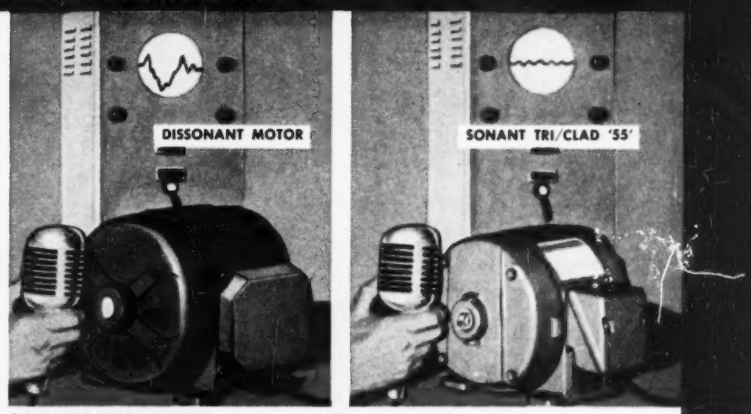
Here's the all-new Tri/Clad '55' motor — now available in NEMA 182 and 184 frame sizes.

You can get complete information on this dramatic motor achievement by writing for bulletin GEA-6013 on Tri/Clad '55' Dripproof motors, GEA-6012 on Tri/Clad '55' Enclosed motors, or GEA-6027 on Tri/Clad '55' Gear-motors, or by contacting your nearby G-E Apparatus Sales Office or G-E Motor Agent. General Electric Company, Section 648-1, Schenectady 5, N. Y.

YOU GET EVEN BETTER PERFORMANCE



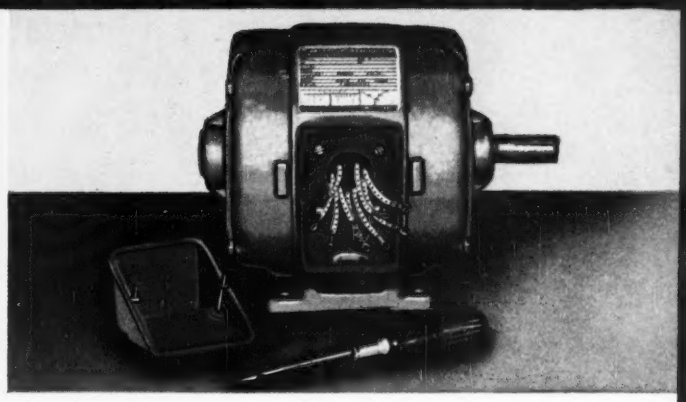
HIGHER FULL-LOAD SPEEDS is only one of many improved characteristics of this new G.E. motor. Above shows comparison of an ordinary motor with the Tri/Clad '55' — both rated at 3600 rpm.



SONANT OPERATION of the new Tri/Clad '55' motor has been laboratory tested and proven. Motor operates at reduced noise level, and operating sound is pitched to a more pleasant frequency.

YOU GET EVEN MORE INSTALLATION AND MAINTENANCE SAVINGS

NEW BEARING SYSTEM allows this motor to run longer than other motors without regreasing. One reason—greatly improved synthesized grease with 8 times the mechanical stability of ordinary grease.



EASIER TO SERVICE, the new Tri/Clad '55' has larger conduit box diagonally split for simplified wiring. Perma-numbered leads mean that even clipped and stripped wires are instantly identified.

Progress is our most important product

GENERAL ELECTRIC

Celite Filtration assures perfect clarity—

adds eye appeal and buy appeal to food products

TO GIVE foods and beverages that extra quality which results in more sales appeal, leading processors depend on Celite* Filtration.

The Celite method is *efficient.* It removes even the finest suspended solids. Moreover, Celite Filtration is *economical.* It may be used with any type of conventional filter, it is almost automatic, and skilled labor is not required for routine operation. And Celite Filtration is *flexible.* To meet your specific requirements, Celite comes in nine standard grades of microscopically controlled particle size. The right balance between degree of clarity and rate of flow may be easily controlled.

To purify water in large volume—to achieve brilliant clarity in many food products such as sugar, syrups, wine, beer, vegetable oils, cooking fats—to remove many colloidal impurities which may affect product quality . . . Celite Filtration offers unexcelled results.

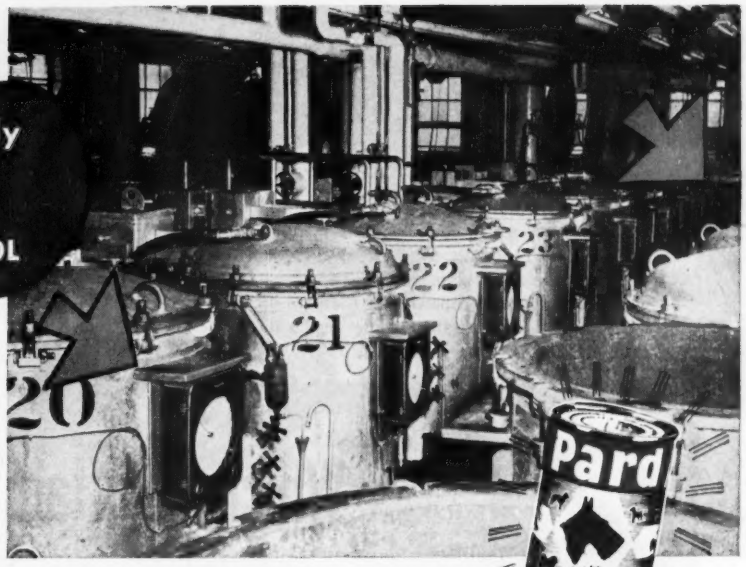
A Johns-Manville Celite Filtration Engineer will gladly discuss the advantages and use of Celite in your product or production process. For his services, without obligation, write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay St., Toronto 1, Ontario.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville CELITE FILTER AND PRESSING AIDS

Cooking of Swift's PARD is automatically regulated by POWERS TEMPERATURE CONTROL



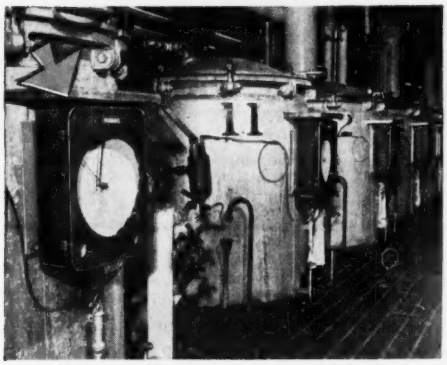
SWIFT & CO.

guards PARD quality with

POWERS

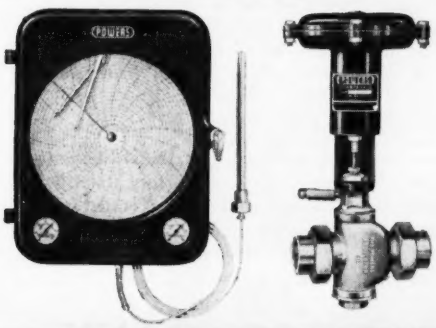
Temperature Recording Regulators on Cooking Retorts

One of the important steps insuring PARD'S uniformly high nutrient content, taste, color and odor is accurate temperature control of cooking operations. Powers instruments are used here on cooking retorts in which Pard is processed.



Other processes and operations in Swift & Co. plants regulated by Powers controls are:

Large Water Heaters • Booster Heaters for Sterilizing • Hog Scalding Vats and De-hairing Machines • Cooking Vats, Kettles and Sausage Steaming Cabinets • Smoke Houses • Drying, Curing and Chilling Rooms • Slicing and Packaging Rooms—and Many Processes in By-Product Plants.



If you have a problem of temperature or humidity control, contact your nearest POWERS office. There's no obligation. With over 60 years of experience and a wide variety of pneumatic and self-operated controls we may be able to help you select the best equipment for your requirements.

(SCR)

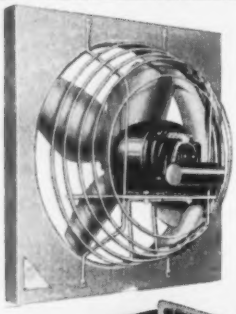
THE POWERS REGULATOR CO.

SKOKIE, ILLINOIS • OVER SIXTY YEARS OF AUTOMATIC TEMPERATURE CONTROL
OFFICES IN OVER 50 CITIES IN U. S. A., CANADA, AND MEXICO • SEE YOUR TELEPHONE DIRECTORY

"Here's My Problem"

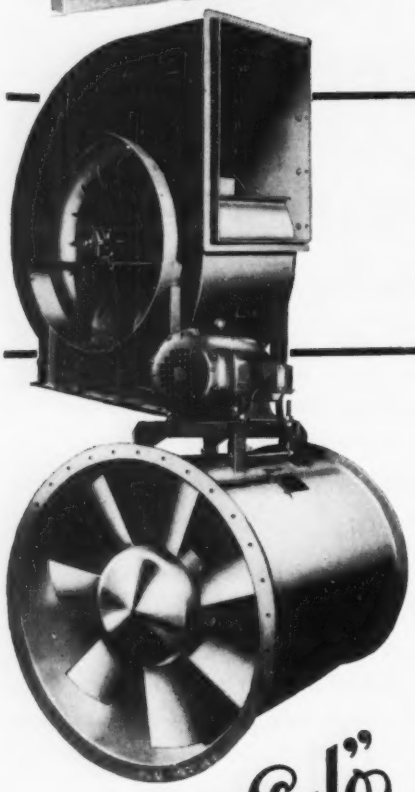
CUSTOMER:

First, one of our older buildings has areas which need spot ventilation. Then, in another building, we're going to need large-capacity exhaust to get rid of dust and moisture. Finally, we need additional capacity in an old system where we've just installed some air cleaning equipment. Now, my problem is . . .



Which "Buffalo" Fan Shall I Use?

BUFFALO REPRESENTATIVE: "To begin with, no single type of fan is the best solution to *all* problems. The best and cheapest answer to your spot ventilation, for instance, is the new Type "NV" Breezo Fan. An efficient propeller fan with strong, rigid, die-formed square panel, the "NV" is simple to install in outside walls wherever you need to exhaust stale air. It can be operated free-air or duct-connected (¼" to ½" s.p.) equally well. The "NV" is made in sizes for 500 to 5500, cfm capacities, and if you need larger capacity, use the new "NV" Heavy-Duty Belt-Aire, it's in sizes up to 90,000 cfm.



"Now, for your large-capacity exhaust system, you'll get greatest long-run satisfaction and economy with the new Type "BL" Limit-Load centrifugal fan. It's the type recommended most frequently for large systems —straight ventilation, air washer and air conditioning supply. You can't overload it, and it gives stable performance from shut-off to free air delivery. And you can pick exactly the rated capacity you need, from 1000 to 500,000 cfm, with no waste in an oversize fan or over-specified driving power.

"But where you need to step up the capacity of a system, mount an axial flow fan in a straight portion of your ductwork. The "Buffalo" Axial Flow is light, compact and takes little more space than your duct. It's extremely efficient in straight runs, and has guide vanes to keep turbulence and noise at a minimum. So you see, there is no *one* fan for all jobs. At Buffalo, we make all types and sizes, so that you can pick one that's practically tailored to your particular need. We've been building fans for 77 years, too, which means that you can be sure of any "Buffalo" fans you pick."

SUGGESTION: and most important of all, remember that Buffalo Engineering Sales Representatives are all technical graduates, factory trained for a number of years; they know fans and their application. Located in all principal cities, they are ready to assist you, too, in fan selection. Why not call on yours today?

"Buffalo"

BUFFALO FORGE COMPANY

152 MORTIMER ST. BUFFALO, N. Y.

PUBLISHERS OF "FAN ENGINEERING" HANDBOOK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Sales Representatives in all Principal Cities

VENTILATING FORCED DRAFT | AIR CLEANING COOLING | HEATING | AIR TEMPERING PRESSURE BLOWING | INDUCED DRAFT EXHAUSTING

NATIONAL CAN

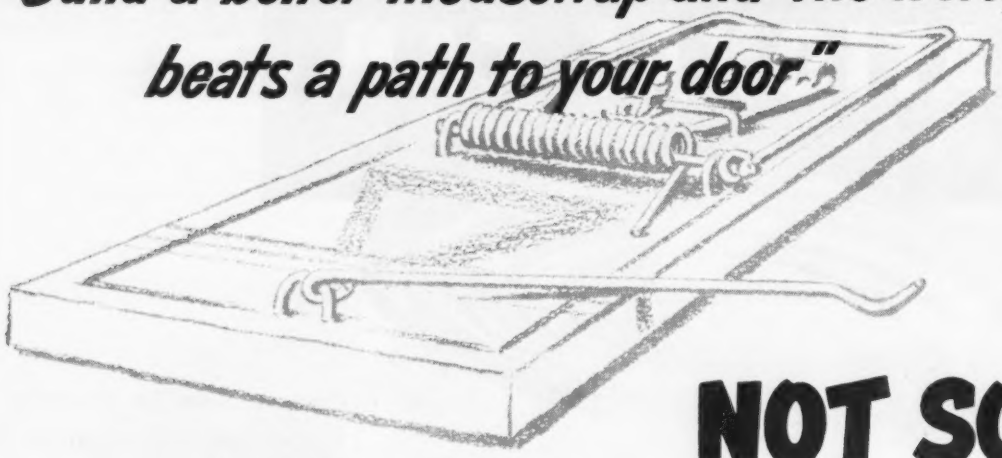
A walk down the aisle of any super-market will point out the vast array of products packaged in National Can containers. A great part of the development of these packages was done by NC's team of production expert, research chemist, agronomist and merchandising counsel. Their half century of can making know-how is always at your service. Why not call or wire — today — and have them help you, too. No obligation, of course.

NC

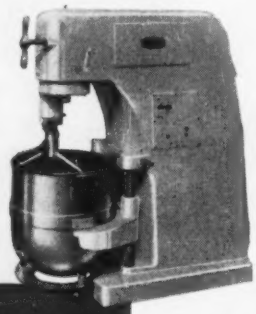
NATIONAL CAN CORPORATION

Plants At: BALTIMORE, MD. • CHICAGO, ILL. • MASPETH, N.Y.
CLEVELAND, OHIO • HAMILTON, OHIO and WARREN, OHIO

"Build a better mousetrap and the world beats a path to your door."



NOT SO.

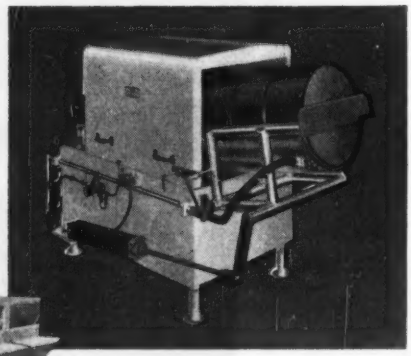


VERTICAL MIXERS
—20 to 140 quart capacity

INGREDIATORS

Mousetraps or mixers, if you've built a good one, and want customers, you have to tell the world. At **Read Standard**, we've been building the finest in bakery equipment and telling the world about it since 1907 . . . and a lot of bakers have beaten a path to our door in those 47 years. In recent years, our engineers have developed certain items of equipment that are finding increasing application in the food field as well as the baking industry. We'd like to tell you more about them. If you feel that one of the units pictured here might be the solution to a particular problem in your food processing or baking operations, let us hear from you, and a qualified sales engineer will call to acquaint you with just what **Read Standard** equipment is capable of doing . . . for you.

POLYPLANE CONVEYORS
—up to 400 pounds of flour per minute



THE AUT-O-MELT

READ STANDARD
CORPORATION

BAKERY-CHEMICAL DIVISION
York, Pennsylvania • Los Angeles 39, California

"the

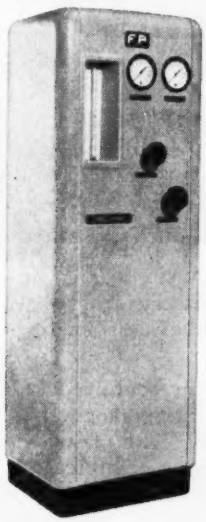
Ratochlor

chlorinator has opened my eyes,"

says Raymond Webster, Sanitary Engineer.
Seabrook Farms, Bridgeton, N. J.

"At Seabrook Farms we have a double job – chlorinating industrial and domestic waste. For years it was expected that the chlorinating equipment we used would break down periodically. We had stand-by units to fill the gap and carried $1000 worth of spare parts for emergency repairs. Yearly service charges show that we paid for a repaired unit every three years and still had our old, leaky chlorine dispensers. Then I heard about the Ratochlor Chlorinator."

Raymond Webster, Sanitary Engineer at Seabrook Farms, further states: "I asked for information on the Ratochlor unit and then a full scale demonstration. I gave this unit every test I could. Once the first unit was installed, it took only a few days of operation to open my eyes to its great benefits over the old equipment. No longer was it necessary to enter the chlorinating room at times wearing a gas mask. No longer were breakdowns a constant problem. The spare parts I carry for our two Ratochlor units I can carry in my two hands. Not only is the Ratochlor Chlorinator cheaper in first cost, but it saves us over and over again on expensive service calls. I'm 100% sold on the Ratochlor and will tell anyone the same, anytime."



Why the Ratochlor warrants your interest

The Fischer & Porter Ratochlor unit is the first really new development in chlorinators in a quarter century. It is scientifically designed not only for ease of operation, but with the absolute maximum of corrosion resistance. It is new, because many of the corrosion resistant parts built into the Ratochlor Chlorinator were not even invented ten years ago. From the corrosion resistant, fibre glass cabinet, which never needs painting, to the diaphragm regulator, offered after five years of successful tests—the F & P Chlorinator is far superior to any unit ever offered. Gone forever are leaky water seals, corrosion-vulnerable fittings, repeat repairs. It will pay you to find out now about the new Ratochlor Chlorinator. Write today for full information and facts on free operating tests in your own plant—plus details on the Fischer & Porter *IRON-CLAD* Guarantee.

complete process instrumentation

FISCHER & PORTER CO.

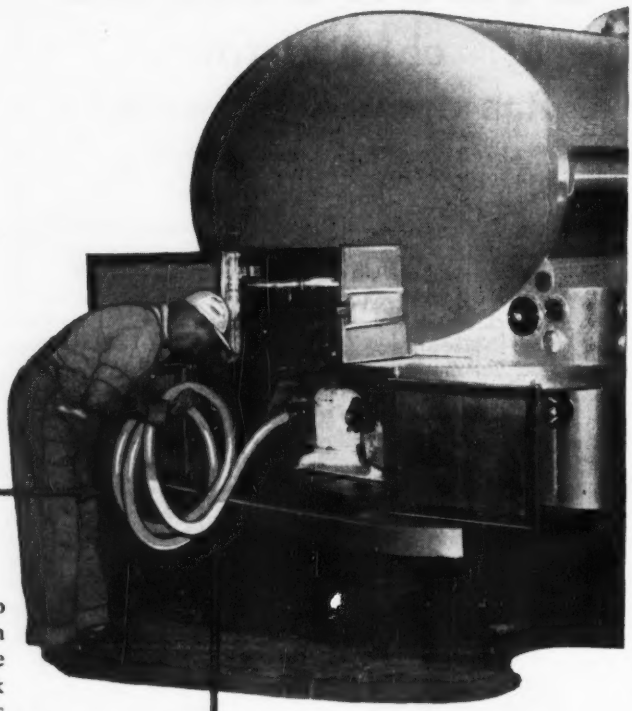
4510 Fischer Road, Hatboro, Penna.

2284

Company owned sales and service branches strategically located throughout the world.

Safe EVEN FOR MILK!

TYGON
flexible plastic
TUBING



TYGON TUBING as used in the transfer of raw milk from trucks to storage tanks.

Raw milk is particularly sensitive to contamination. It readily picks up foreign tastes and odors. That's why especial care must be taken in the selection of milk handling and processing equipment. That's why TYGON Tubing is used as flexible piping on bulk milk trucks, milk dispensers, milking machines, and in general dairy applications.

TYGON Tubing is non-toxic and non-contaminating. It's been fully tested and approved by Boards of Health and the F. D. A. It's completely safe to use with milk or other sensitive foods and beverages.

Additionally, Tygon is easy and economical to use. It's light, strong, and fully flexible—goes from anywhere to anywhere. Its high translucency provides full solution visibility and accurate flow control. Its smooth surfaces stay smooth — flush clean easily. Its chemical resistance permits the use of strong cleaners or bactericides. Its non-oxidizing characteristics give it long life.

TYGON Tubing comes in continuous lengths and a wide variety of sizes ranging up to 2" ID. It also is available with plastic or stainless steel braided jacket reinforcement for use under pressures up to 300 psi.

Write, today, for more information. Ask for Bulletin T-77.

U. S. STONEWARE

46-D

PLASTICS AND SYNTHETICS DIVISION AKRON 9, OHIO

THEY'RE ONLY AS GOOD AS THEIR FLAVOR!

Few fields of specialization have assumed greater importance in recent years than that of the Food Technologist. *The food industry in general leans heavily upon his judgment in arriving at many of its decisions. That is important to us because food technologists who know our products are among our strongest boosters. They know that for consistency of quality and reliability, they can always confidently recommend* FRITZSCHE *A FIRST NAME IN FLAVORS SINCE 1871.*

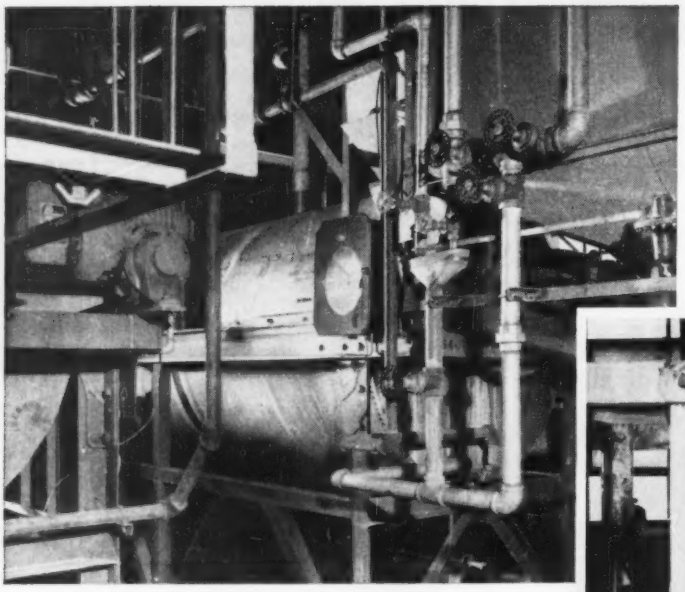
FRITZSCHE *Established* 1871

Brothers, Inc.

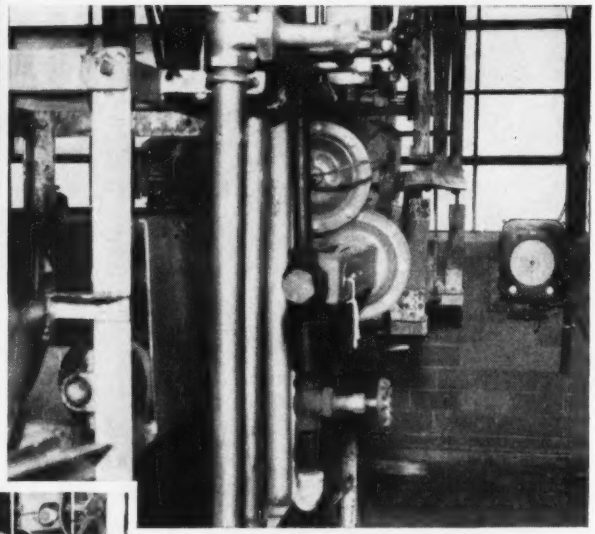
PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

BRANCH OFFICES *and* °STOCKS: *Atlanta, Georgia, Boston, Massachusetts,* °*Chicago, Illinois, Cincinnati, Ohio, Cleveland, Ohio,* °*Los Angeles, California, Philadelphia, Pennsylvania. San Francisco, California, St. Louis, Missouri,* °*Toronto, Canada and* °*Mexico, D. F.* FACTORY: *Clifton, N. J.*

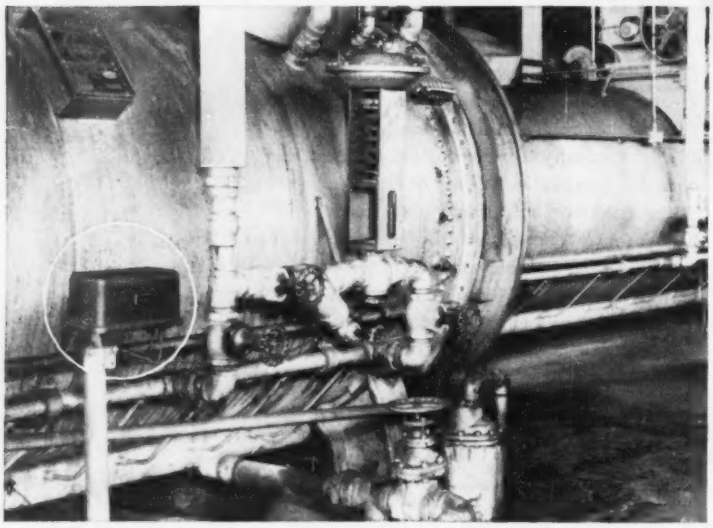
HOW TO BUILD A



Blanching — here at the Glencoe, Minn. plant one of the first steps in quality processing of Green Giant Brand Peas is protected by the Taylor Dual Blancher Control System. Enzyme action is arrested, while firmness, color and texture are assured, and steam consumption is reduced. Variations in inlet temperatures and feeding rates are compensated for by controlling temperatures automatically at both ends.

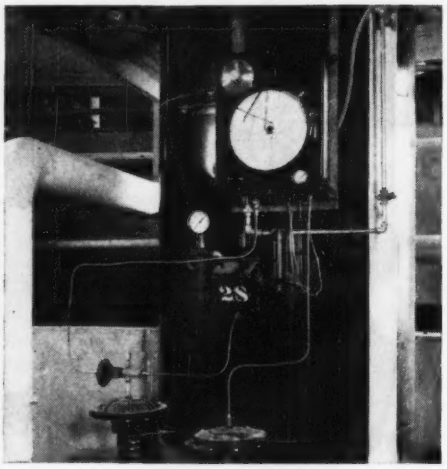


Quality grading here is under the watchful eye of the latest Taylor Brine Density Control System. Brine density is precisely maintained by the automatic control of both brine and water additions, regardless of whether higher or lower density is called for.



Continuous pressure cooker cooler at the Glencoe plant is completely and precisely controlled. An unique feature is the TRANSAIRE* Temperature Transmitter (shown in circle above) which detects the slightest variations in temperature, so that corrections are made practically instantaneously. The product is completely sterilized in the shortest possible time, producing better color and flavor.

*Reg. U. S. Pat. Off.



Retorting — when conventional retorts are used the product is steam cooked by automatically controlling the processing temperature and time, as well as venting on a pressure basis. Venting errors are eliminated. A minimum of steam is consumed and there's no pressure override.

GREAT BRAND NAME

—leave nothing to chance!

THERE are many factors that enter into the building of a great brand name. Selection of the best possible growing areas, improvement of the seed, perfectly-timed harvesting, and application of advanced technology in processing. It is at this processing stage that all the preceding precautions can be nullified or capitalized upon.

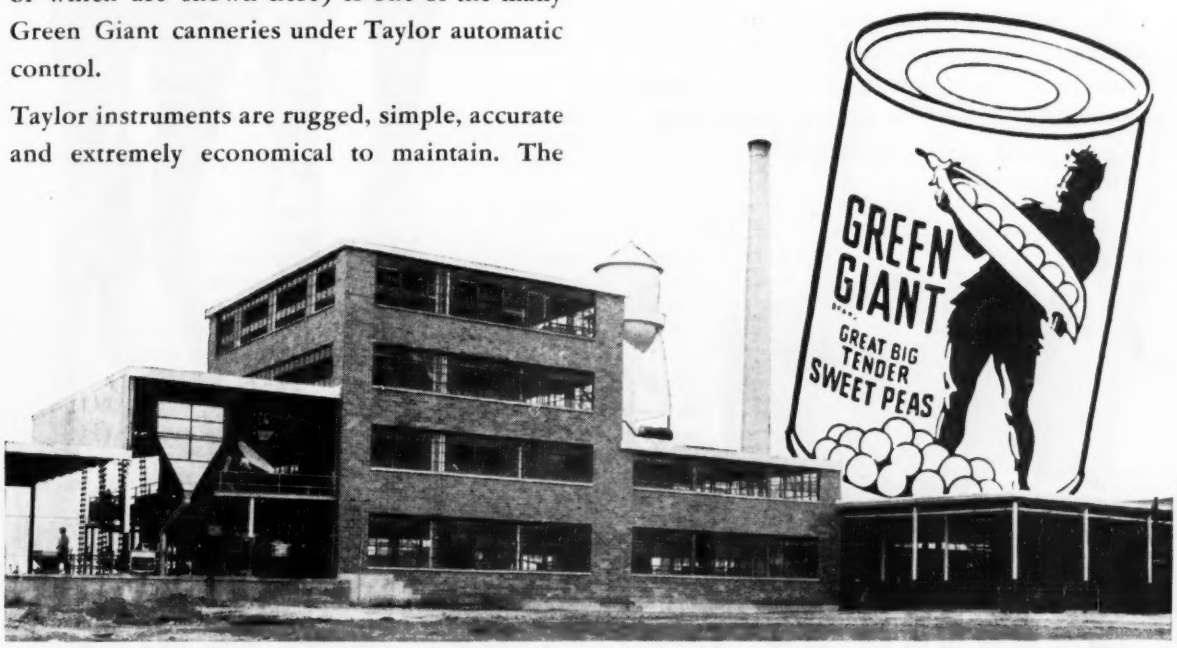
Green Giant Company believes in leaving nothing to chance all along the line. And we are proud of the fact that Taylor instruments play an important part in protecting their fine name at the critical stages of their processing operations. The Glencoe, Minnesota, plant (pictures of which are shown here) is one of the many Green Giant canneries under Taylor automatic control.

Taylor instruments are rugged, simple, accurate and extremely economical to maintain. The control systems illustrated, and many others designed by Taylor to meet specific needs, have been proven in action. And Taylor Field Engineers have the experience and the know-how to give quick service when it's needed. That's why we say, when modernizing your plant or equipping a new one, specify "Taylor-Equipped, As Usual!"

Write now for **Catalog 500.** Taylor Instrument Companies, Rochester, N.Y.; Toronto, Canada.

♦ ♦ ♦

Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.

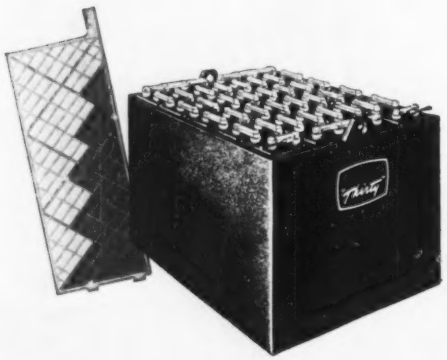


Taylor Instruments MEAN ACCURACY FIRST

HIGH-LEVEL PERFORMANCE

THANKS TO BATTERY POWER!

Use battery-power for your industrial trucks and you've got high-level performance for low-cost handling. Today's trucks give you the higher lifts, shorter turns, faster maneuverability and greater adaptability necessary to meet modern handling needs. Only battery trucks are silent, safe, and fume-free. And, remember, there's *no* battery power like *Gould* power. *Insist* on *Gould!*



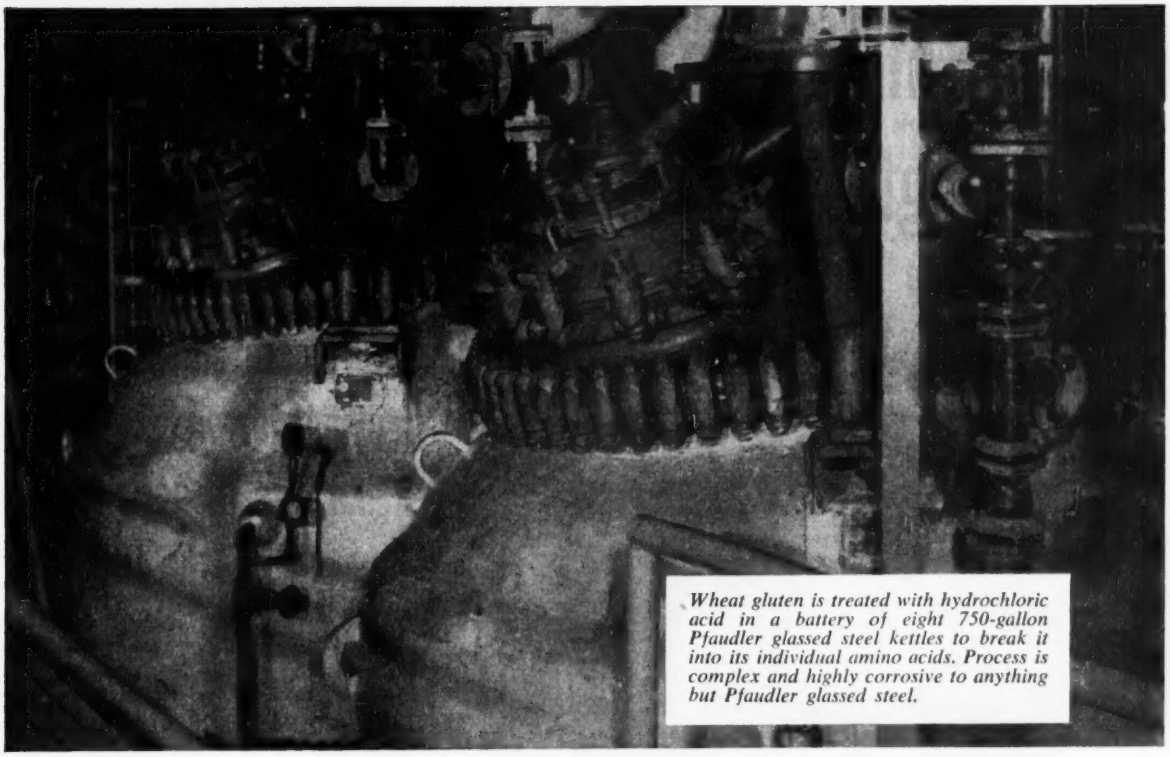
Specify
THE GOULD "THIRTY"
with New Diamond "Z" Grids—
America's Finest
Industrial Truck Battery

GOULD INDUSTRIAL BATTERIES

GOULD-NATIONAL BATTERIES, INC., TRENTON 7, N. J.

Always Use Gould-National Automobile and Truck Batteries

©1953 Gould-National Batteries, Inc.



Wheat gluten is treated with hydrochloric acid in a battery of eight 750-gallon Pfaudler glassed steel kettles to break it into its individual amino acids. Process is complex and highly corrosive to anything but Pfaudler glassed steel.

To keep monosodium glutamate pure, they digest the wheat . . . not the equipment

If corrosion destroys *your* processing equipment, get this protection

The fact that HCl will digest just about everything except glass makes HCl and Pfaudler glassed steel natural partners in the manufacture of monosodium glutamate.

In making MSG, wheat gluten has to be hydrolyzed with HCl—and no manufacturer wants to contribute part of his equipment to each batch. Corrosion of equipment is costly, and dissolved metal contributes nothing to a product's purity or profitability.

Pfaudler glassed steel reactors make possible accurate control of the digestive process without the complicating dangers of metallic intrusion which can destroy flavor, color, or purity. Pfaudler glassed steel gives you the chemical resistance, the cleanliness, and the smoothness of glass with the strength of steel.

So if corrosion is destroying *your* processing equipment, Pfaudler glassed steel offers the best protection for the least money. This glass is resistant to all acids (except hydrofluoric) and alkaline solutions (up to pH 12 at 212° F.). Fused to steel for strength, no other material compares with it on a service-price basis.

Standard equipment is available for heat exchange, cooking, cooling, mixing, concentration and storage for a wide diversity of processes. It also can be engineered to your specific needs. To bring yourself completely up to date on Pfaudler glassed steel, mail the coupon for Bulletin 902.

Pfaudler

THE PFAUDLER CO., ROCHESTER 3, NEW YORK
Engineers and Fabricators of Food Processing Equipment

Gravity Fillers · Piston Fillers · Steam Peelers · Deaerators · Vacuum Pans · Evaporators

THE PFAUDLER CO., Dept. FE-1, Rochester 3, N.Y.

Please send me Bulletin 902.

Name .....

Title .....

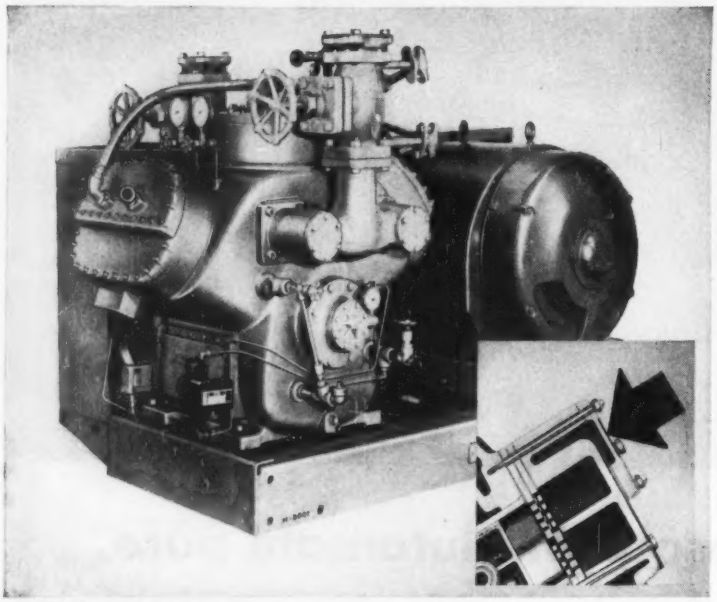
Company .....

Address .....

City ..... Zone ..... State .....

Use coupon on page 209.

Look at all the features of Worthington's new high-speed ammonia compressor



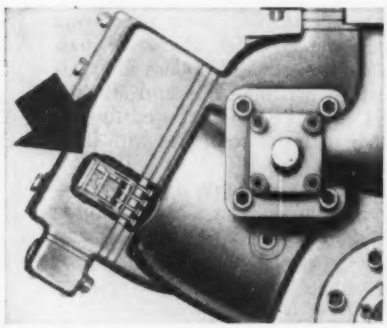
IMPROVED INTERNAL MANIFOLDING—cool suction gas completely surrounds the cylinder walls, providing longer valve life and increased overall efficiency. All passageways between suction discharge and shutoff valves are cast integrally within the crankcase, eliminating outboard fittings. Cross section shows water jacketing on one of the cylinders.

High operating efficiency and lighter weight make this modern unit the talk of the industry

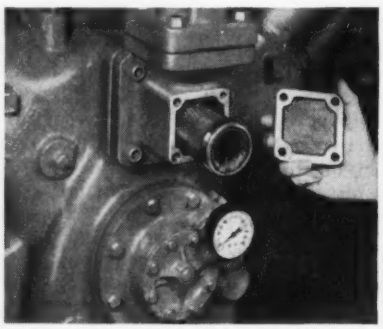
These lightweight, compact Worthington ammonia compressors have the same high operating efficiency and versatility as their lower speed counterparts.

Ranging in capacities from 18 to 150 tons, the new units can be used as high-stage or booster machines.

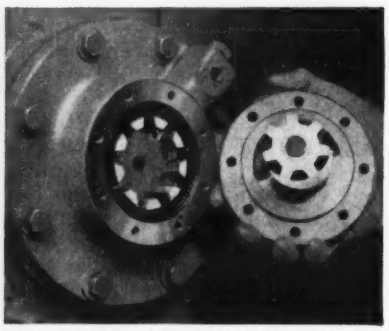
Get in touch with your nearest Worthington district office for more facts about these rugged compressors. Or write to Worthington Corporation, Air Conditioning and Refrigeration Division, Section A.3.56, Holyoke, Mass.



ELECTRIC UNLOADING—a new achievement in variable capacity control. You can start compressor with a normal torque motor; power consumption is automatically balanced against load. Separate unloader units allow easy maintenance . . . no oil or gas pressure lines to worry about.



NEW SUCTION MANIFOLD, with cover plate over suction strainer inlet, allows easy removal of the suction gas strainer for cleaning, without disturbing any of the pipes, valves or other parts. The strainer is unique in that it fits entirely within the crankcase manifold, requiring no additional space.



NEW FORCE-FEED LUBRICATION SYSTEM—full pressure, positive lubrication, regardless of rotation. A new rotary oil pump, driven directly by the crankshaft, eliminates complicated and noisy gear trains. Oil is filtered through a strainer in the crankcase for protection of pump and other moving parts.

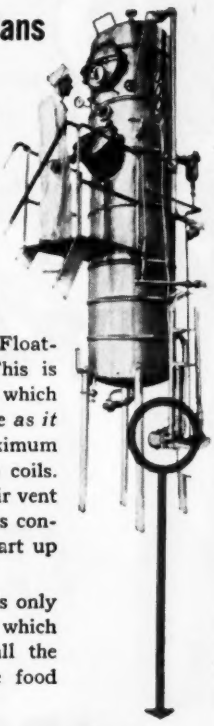
A.3.56

WORTHINGTON

CLIMATE ENGINEERS TO INDUSTRY, BUSINESS AND THE HOME

Misused steam plays havoc with production schedules and costs

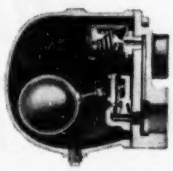
Mojonnier Plays Safe— Installs Sarco FT Traps On Its Vacuum Pans



The Mojonnier Vacuum Pan is used to condense liquid foods. To obtain maximum heat transfer, steam coils must be kept free of condensate, air and gases.

Mojonnier assures the efficiency of its vacuum pans by installing Sarco Float-Thermostatic Traps. This is the only type of trap which discharges condensate *as it forms* thus assuring maximum temperature across the coils. Built-in thermostatic air vent discharges air and gases continuously — both at start up and *during* operation.

The Sarco FT Trap is only *one of 5 different types* which Sarco makes to fill all the trapping needs of the food processing industry.



Sarco Float-Thermostatic Trap

Offers instant removal of condensate plus continuous operation without shock or disturbance of temperature. Available in large sizes and very large capacities.

Use Steam Right

1. To prevent production delays
2. To improve product quality
3. To maintain desired output
4. To reduce labor and steam costs

IN YOUR processing operations, are you up against troubles such as slow-ups, uneven or inadequate heating, poor temperature control—resulting in reduced output, lowered product quality and increased costs?

You may suspect that your equipment is at fault. But process heating headaches often are due to ineffective utilization of steam. The wrong type trap can cause condensate to waterlog equipment. Improper air-venting can reduce the rate of heat transfer by as much as 11%. Manual temperature control may prove erratic, affect product quality, increase production costs.

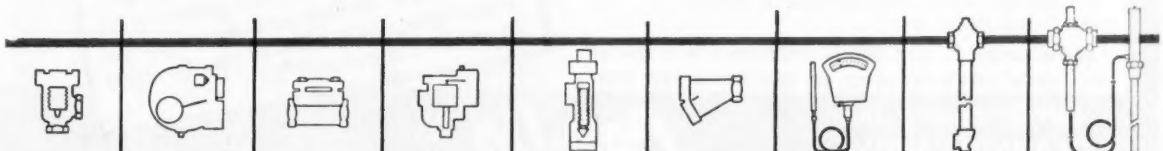
If your plant is suffering from any of these production handicaps, Sarco can help you. Sarco has a wealth of practical experience in the process industries to put to work for you. Plant after plant, with Sarco help, has licked these problems through simple, inexpensive changes. The results have been: increased output, improved product quality uniformly maintained, lower production costs.

Engineering Service: Our engineering service is yours for the asking. Call our local representative, or, write today for case histories describing how other plants in your field have solved similar problems through the proper application of steam traps and inexpensive temperature controls. Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.

SARCO

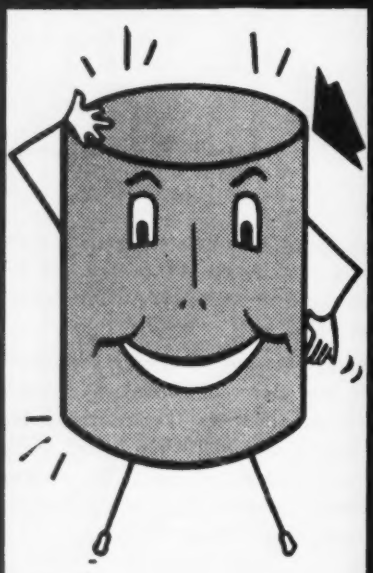
improves product quality and output

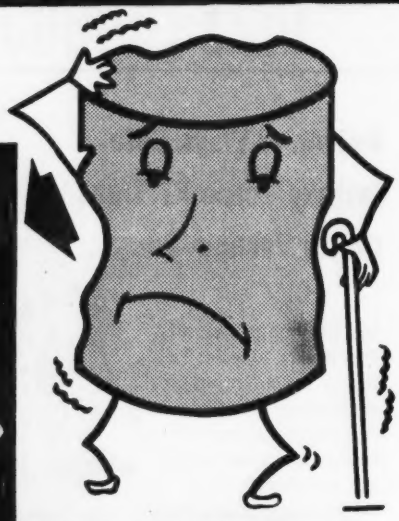
STEAM TRAPS • TEMPERATURE CONTROLLERS • STRAINERS



Thermostatic Steam Traps | Float-Thermostatic Steam Traps | Thermodynamic Steam Traps | Camlift Bucket Steam Traps | Liquid Expansion Steam Traps | Strainers | Electric Temperature Controllers | Water Blenders | Self-Operated Temperature Controllers

Can-Do straightens dented cans!





Here's the practical way to eliminate "dent" losses in your canning operation. Run those "dents" through the CAN-DO can straightening machine — as fast as 12 cans per minute — and you can ship the straightened cans with perfect assurance that their contents are unharmed.

No skill is required to use a CAN-DO. Change-over to any size can takes less than 60 seconds. It's fool-proof, sure, and a real money-maker for you.

If your low vacuum pack operation is troubled with "dents" — (and whose isn't) it will pay you to investigate CAN-DO. Write for descriptive material and prices today.

If you're coming to the CANNING SHOW, send us a case of your "dents". We'll straighten 'em right before your eyes.

"PAYS FOR ITSELF IN ABOUT 6 MONTHS"

says: **W. M. MALIN,**
Vice-President in Charge of Production
HAXTON FOODS, INC.
Oakfield, N. Y.

"We use CAN-DO as a standard production procedure for straightening all low vacuum dented cans. Based on our experience, CAN-DO will pay for itself in about 6 months."

See Can-Do During the 1954 CANNING SHOW
RITZ CARLTON HOTEL
Atlantic City, N. J.

Can-Do, incorporated
204 Franklin Street ● New York 13, N. Y.

A FAIR OFFER

If you will put a Jenkins Valve, recommended for your particular service, on the worst place you can find — where you cannot keep other valves tight — and if it is not perfectly tight or it does not hold steam, oil, acids, water or other fluids longer than any other valve, you may return it and your money will be refunded.

Jenkins Bros

A FAIR OFFER THAT HAS BEEN IN EFFECT SINCE 1869

JENKINS VALVES

LOOK FOR THE DIAMOND MARK

SINCE 1864 TRADE JENKINS MARK

Jenkins Bros

This famous "Fair Offer" has been published at frequent intervals for the past 84 years. It can be repeated, again and again, only because all Jenkins Valves measure up to its sincere pledge of exceptional dependability.

Despite their *extra value*, proved by countless economy records in every type of service, *you pay no more* for Jenkins Valves. Jenkins Bros., 100 Park Ave., New York 17.

They're helping deliver a can of peaches

The can of peaches in a supermarket pushcart may well have started its travels in an ore truck like this one you see in Malaya's largest open-pit tin mine. For over a third of the world's tin is mined and smelted in Malaya.

Known as Straits Tin, this metal is 99.87% pure and world famous for its absolute reliability of grade. And this uniform quality is all-important in producing the tin plate cans are made of.

No other kind of container combines all the advantages of the tin can. The tin can is economical, strong, light and compact. It protects its contents from light. It can be easily handled in mass without breakage. And it is more convenient for the consumer both to store and to use.

With an ample supply of Straits Tin available for the future at a fair and reasonable price, does it make sense to seek substitutes for tin cans that will not be better, may not be as good, and will probably cost more?

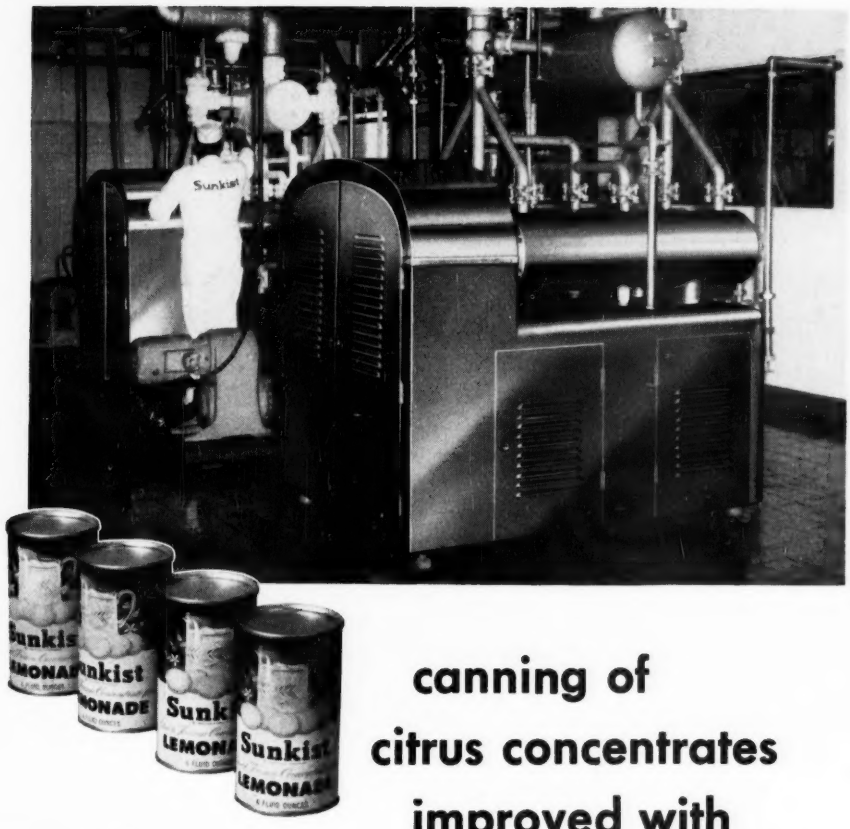
As more and more different food products are packed in cans, plentiful, economical Straits Tin will be a more useful material than ever for the entire food processing industry!

A free copy of our new bulletin, "How Straits Tin Can Help You", is yours for the asking.

MALAYAN TIN BUREAU

THE MALAYAN TIN BUREAU Dept. 265, 1028 Connecticut Ave., Washington 6, D.C.

You get perfect quality control with Votator® Continuous Processing Apparatus



canning of citrus concentrates improved with Votator SLUSH FREEZING APPARATUS

FAMOUS Sunkist flavor—like that of other leading brands of frozen concentrates—is protected by closed-system, continuous processing. VOTATOR Heat-transfer Apparatus slush-freezes the citrus juice in just a few seconds. Air is excluded, thus oxidation is minimized, and flavor and vitamin content are preserved.

Heat-transfer is basic in food processing and the VOTATOR mechanism is the most effective application of basic heat-transfer theory yet devised. Use it in your processing—for perfect quality control, and to reduce labor and handling costs to a minimum.

*VOTATOR-Trade Mark Reg. U. S. Pat. Off.

The GIRDLER Company
A DIVISION OF NATIONAL CYLINDER GAS COMPANY
VOTATOR DIVISION

COOLING

CHILLING

MIXING

COOKING

PASTEURIZING

STERILIZING

CRYSTALLIZING

PLASTICIZING

SLUSH FREEZING

ENZYME INACTIVATION

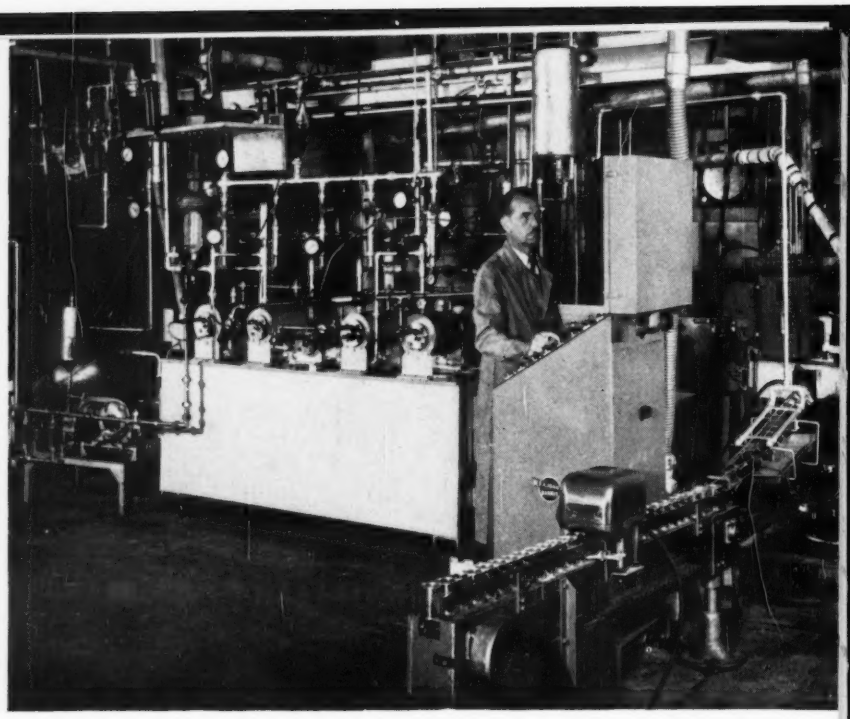
AERATING

WHIPPING

Mail coupon for information

GIRDLER

offers complete service– from process design to finished plant



STERILIZING. This asceptic canning pilot plant is typical of the many research projects at Girdler which have resulted in distinctive processes and apparatus for many applications. When used for sterilization, VOTATOR Heat-transfer Apparatus heats the product to temperatures of 280° or 290° F., holds at the elevated temperature, and cools to a pre-determined level. High speed processing and accurate temperature control prevent damage to the product.

You can call on Girdler for complete process design, engineering and construction service. Put Girdler's broad experience in the food industry to work when *planning* your facilities for efficient continuous processing.

This 32-page book gives you complete information on the application of VOTATOR Heat-transfer Apparatus. It contains a 12-page technical section with valuable reference data and charts. Send coupon today for your free copy.

THESE PRODUCTS CAN BE PRODUCED *BETTER* WITH VOTATOR CONTINUOUS PROCESSING APPARATUS

Marshmallows
Cake Batter
Cream Style Corn
Dog Food
Chocolate Milk Drink
Edible Starch (For Salad Dressing)
Pie Filling
Soup
Lard
Margarine
Shortening
Sweetened Condensed Milk
Invert Syrup
Eggs
Concentrates, Fruit Juices and Purees
Juice Concentrates
Starch Gum Jellies
Strained Foods

THE GIRDLER COMPANY
224 East Broadway, Louisville 1, Kentucky

Please send booklet describing Continuous Processing.

Name _____

Position _____

Company _____

Address _____

City _____ *State* _____

The
GIRDLER
Company

A DIVISION OF NATIONAL CYLINDER GAS COMPANY
LOUISVILLE 1, KENTUCKY
VOTATOR DIVISION: New York, Atlanta, Chicago, San Francisco

pick the stainless that fits best

When selecting stainless steel be sure you pick the correct type for your particular application. For some grades resist corrosion better . . . others have superior heat resistant properties. Some are easier to machine . . . still others can be more readily formed or welded.

In every case there is a grade of Crucible REZISTAL Stainless Steel that is best suited to the job. And to help our customers select the type that will provide the best service for the lowest cost, we make available all the design, metallurgical, fabricating and application data we have accumulated in our years of stainless steel experience with many different industries.

Our staff of field representatives brings you the benefit of our vast technical resources. And the quality of REZISTAL Stainless Steel sheets, strip, plates, bars, wire, forgings, castings and tubing produced in our modern integrated mills is unsurpassed in the industry. When you have an application for stainless, call Crucible.

CRUCIBLE first name in special purpose steels

54 years of Fine steelmaking **STAINLESS STEEL**

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

STAINLESS • REX HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS

examine this closely

inside . .

PHILADELPHIA MOTOREDUCER®

THERE'S NOTHING ELSE LIKE IT

Here is the ultimate in drives designed for agitators, mixers and other equipment demanding a self-contained, vertical power source.

The "MotoReduceR" is of unusually compact construction; employs planetary "in-line" reduction gearing with a standard flange mounted motor. The ring type base greatly simplifies mounting on tanks and other equipment.

The illustration at the left shows the distinctive "Dry-Well" construction which prevents oil leakage down the output shaft.

The vertical MotoReduceR can be supplied for output speeds from 9 RPM to 420 RPM with standard motor speeds. Units up to 100 Horsepower are available. A full range of horizontal units can also be supplied. Write for catalog MR49.

Philadelphia Gear Works, INC.

ERIE AVE. AND G ST., PHILADELPHIA 34, PA.

NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA.

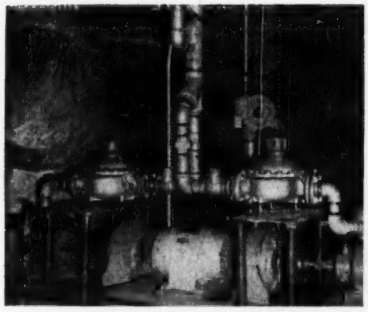
Industrial Gears and Speed Reducers
LimiTorque Valve Controls

(ADVERTISEMENT)

36 Different Ingredients Handled by Liquid Meters, 174 Food Plants Report

Accurate control of batch mixing, general process control, and inventory control are the three biggest advantages offered by positive displacement meters now in use in their plants, according to executives and technologists in 174 food companies in a recent survey. Discussing applications for meters of the type manufactured by Neptune Meter Company, more than 36 liquids were reported, including water (hot and cold), corn syrups, liquid sugars, and other sweeteners; cocoa butter, cocoanut oil, and other fats and oils, chocolate, flavors, coffee, wine, alcohol and many others. Most desirable feature for accurate batching was said to be the automatic quantity cut-off (Neptune Auto-Stop). Other types in use includes round-dial registers for manual batching or periodic readings, and simple totalizing registers used where infrequent readings for inventory control were required.

You simply push the buttons on this Model 432 Auto-Stop meter to set the pounds or gallons required by the formula, open the valve, and the meter shuts the valve automatically at the required amount.



These Neptune Meters with simple totalizer registers measure liquid sugar drawn from storage tanks, keeping tabs on inventory. Neptune batching meters also have totalizer counters, so accurate records can be kept.

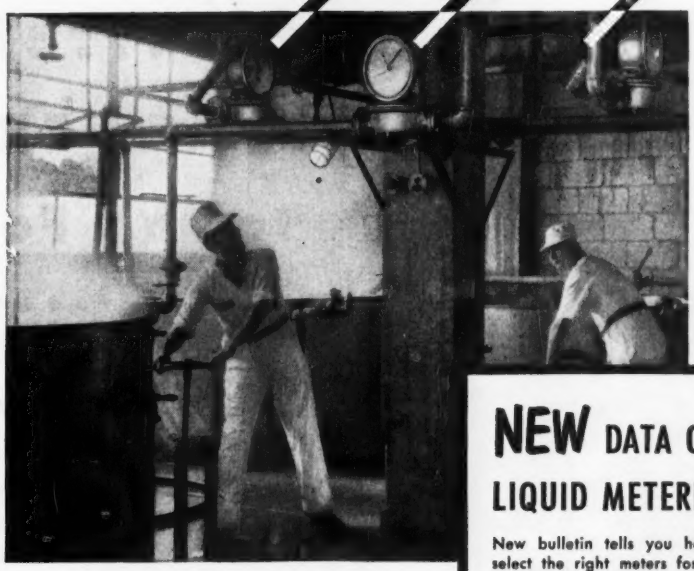
Helpful Information Offered

Information helpful in selecting the right liquid meter for any specific application is offered free. Ask for bulletin 566 LF. Neptune Meter Company, 50 W. 50 St., New York 20, N. Y.

CATSUP FOR A BILLION HAMBURGERS

Quality Controlled

WITH NEPTUNE METERS



The G. S. Suppiger Company makes 30,000,000 bottles of Brooks catsup a year —catsup with a carefully controlled "tangy" flavor — not sweet — not biting — but "just right." Accurate measurement of liquid sugar and other liquid ingredients is vital —accurate measurement delivered to batch after batch by the fine-instrument precision of the three Neptune Meters shown above.

In plant after plant Neptune Meters are the key to quality control. They pay for themselves by eliminating spoilage, spillage, and the unsanitary muss and fuss of gauge sticks, pails or batch tanks. Use them for accurate cost accounting and inventory control, too. Positive displacement type, simple in design, quality built for sustained accuracy. Many types available for handling over a hundred different industrial liquids.

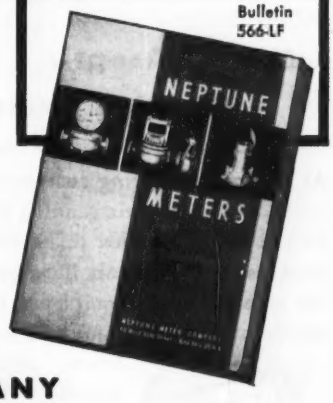
NEW DATA ON LIQUID METERING

New bulletin tells you how to select the right meters for *your* process. Covers meters for handling more than 100 industrial liquids—hot or cold water, oils, syrups, brines, soap solutions, scores of chemical solutions, etc. Shows meters from ⅝" to 6"—from simple horizontal straight-readers to the newest 432 Auto-Stop automatic batching meters. A gold mine of information for processing engineers!

Get Started Now!

Write for it—it's free. Ask for it by number:

Bulletin 566-LF



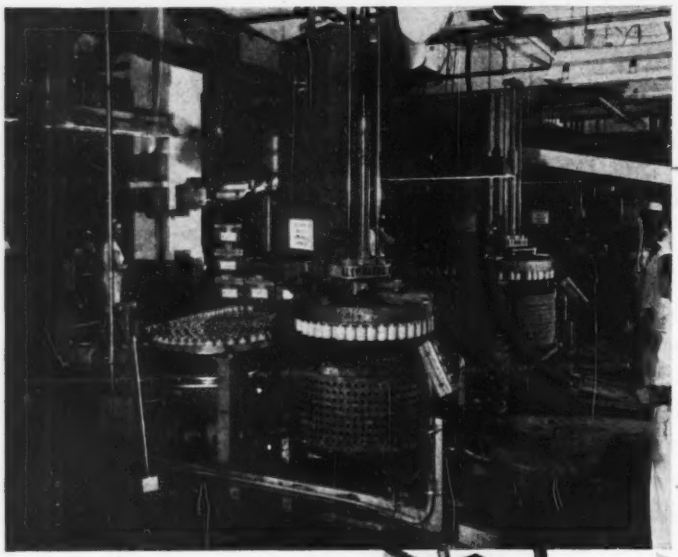
NEPTUNE METER COMPANY
50 WEST 50th STREET • NEW YORK 20, N. Y.

Branch Offices

ATLANTA • BOSTON • CHICAGO • DALLAS • DENVER • LOS ANGELES
LOUISVILLE • NORTH KANSAS CITY, MISSOURI • PHILADELPHIA • SAN FRANCISCO • PORTLAND, ORE. • Canadian Factory: TORONTO 14, ONT.

W. F. & JOHN BARNES

. . . offers this COMPLETE MODERN SERVICE to the Food Packer—

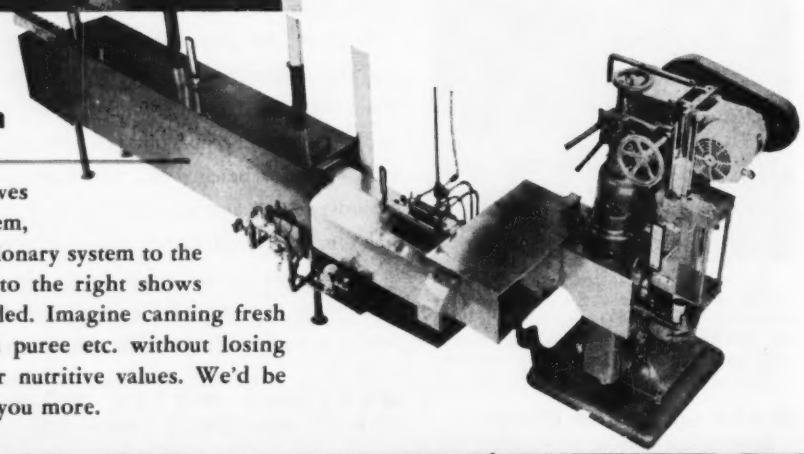


Loading 500 jars per minute with minimum breakage

Shown above is a Barnes retort basket loader. It handles over 500 baby food jars per minute. It is one of other Barnes machines and equipment which is helping manufacturers to lower costs through faster handling and minimizing breakage of glass jars. It is the result of close co-ordination between food packer and our engineers.

Martin Aseptic Canning System

As sole manufacturing representatives of the Martin Aseptic canning system, we are pleased to offer this revolutionary system to the food packer. The unit illustrated to the right shows the compact basic equipment needed. Imagine canning fresh whole milk, orange juice, banana puree etc. without losing flavor, color or nutritive values. We'd be pleased to tell you more.

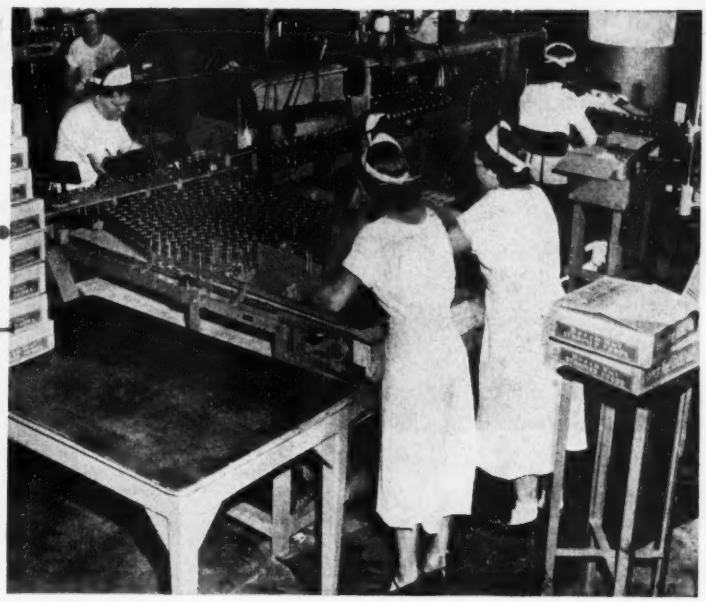


W. F. & JOHN BARNES

W. F. and JOHN BARNES

PROCESS EQUIPMENT DIVISION 303 SOUTH WATER STREET, ROCKFORD, ILLINOIS

Food packing is a fascinating business but, as you know, it also has its problems. That's where we'd like to come in. We are relatively new in this field but have had some success in helping packers solve knotty problems. So, if you pack in glass or tin we'd be most interested in working with you in *any* phase of production. Your inquiries will be given careful consideration and prompt attention.



Single Filers

Here's a new, efficient method of unscrambling empty glass. The illustration shows operating end of machine where girls are positioned while dumping cases of glass onto the receiving conveyor belt. Jars pass gently through agitating fingers and are discharged to conveyor at the rate of 500 to 600 per minute depending upon size and shape. Other models available for filled jars.

Conveyors

Can Elevators such as illustrated at the left or special elevators to suit your specific requirements can be designed to suit the maximum convenience in handling cans to and from your various processing machines. If you pack in glass or tin, call on Barnes engineers for suggestions. There is no obligation for this service.

Other Barnes Products

Actually our service to the food packer consists of engineering and manufacturing facilities. The products represent the end result of a close coordination between the packer and our process engineers. If you have any problem or wish to improve your processing methods and lower costs call a Barnes engineer. If you wish additional information write for bulletins F-154.

W. F. and JOHN BARNES

PROCESS EQUIPMENT DIVISION 303 SOUTH WATER STREET, ROCKFORD, ILLINOIS

There's only ONE TAPER-LOCK

TAPER-LOCK sheaves run true! The patented Taper-Lock bushing grips the shaft for the full length of the bushing—holds with the firmness of a shrunk-on fit!

Every belt pulls its full share of the load. Grooves, machined on precision equipment, have identical pitch diameters, assuring equal belt tension.

Easy on—Easy off. Slip it on the shaft, line it up and tighten while sighting. In ease and speed of mounting and demounting you'll appreciate there is only ONE Taper-Lock.

No flange, no collar, no protruding parts. Flush hub means safety.

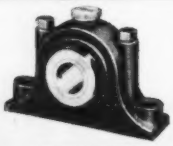
Taper-Lock sheaves are available from distributors' stocks in complete range of sizes in A, B, C and D grooves.

DODGE MANUFACTURING CORPORATION
2800 UNION STREET, MISHAWAKA, INDIANA

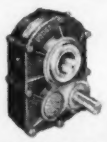
1878 DODGE 1953 75th ANNIVERSARY

DODGE
of Mishawaka, Ind.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory-trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone book.

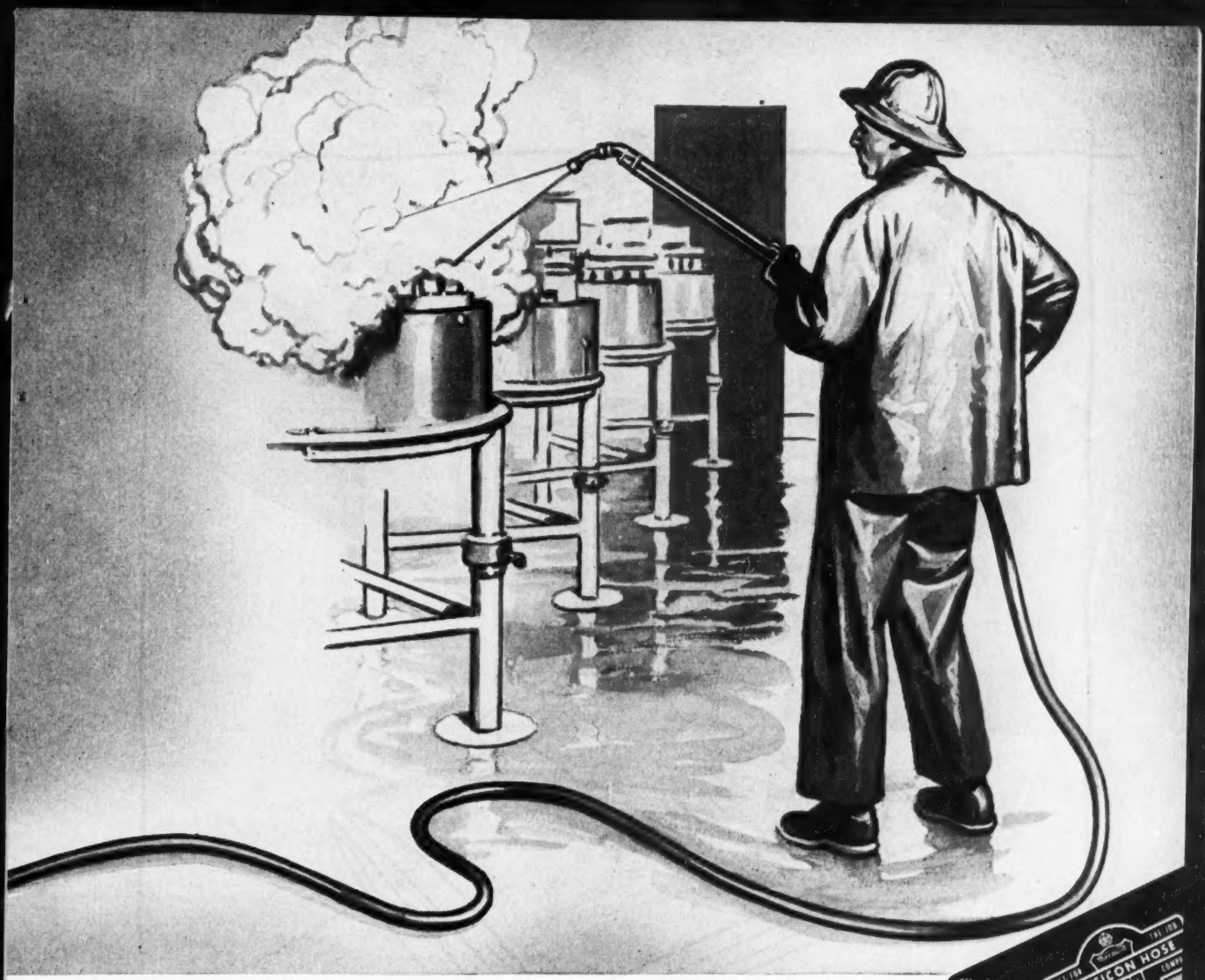


DODGE-TIMKEN PILLOW BLOCKS



TORQUE-ARM SPEED REDUCERS

ROLLING GRIP AND DIAMOND D FRICTION CLUTCHES



Thermoid Hose designed specifically for use in food processing plants

Thermoid Industrial Rubber Products — Quality Value Service

Thermoid designs and manufactures many types of hose for a wide variety of specific industrial applications. These 3 are ideal for use in food and beverage plants:

VERSICON — most versatile hose ever developed. Handles air, water, oil, gasoline, dilute acids and gases.

CREAMERY — for use with hot or cold water and low pressure steam, for cleaning and sterilizing.

BREWERS — for use in breweries, wineries and food plants. Imparts no taste or odor.

Thermoid research is responsible for new, better constructions that make Thermoid hose easier to handle . . . wear longer. Ask your Thermoid Distributor for the hose best suited for your job.

Thermoid

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

welcome the magna man

● In every industry in which essential oils and related products play an important part, buyers extend a hearty welcome to the MM&R representative—the MAGNA man.

These buyers know that the MAGNA man comes to them from one of the oldest and most respected Essential Oil firms in the business...that the quality of his products is beyond question... that he brings with him a wealth of knowledge about their problems and helpful suggestions for increasing their sales.

The MAGNA man is a good man to know. You'll find it worth your while to make him welcome when he calls.

M&R MAGNUS

Magnus, Mabee & Reynard, inc.

Since 1895 **ONE OF THE WORLD'S GREATEST SUPPLIERS OF ESSENTIAL OILS**

16 Desbrosses Street, New York 13, N. Y. · 221 North La Salle Street, Chicago 1, Illinois

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

When you must have slow speed power, always consider first MASTER Right Angle Shaft Gearmotors. They're very compact . . . low in cost . . . safe . . . and so easy to use.

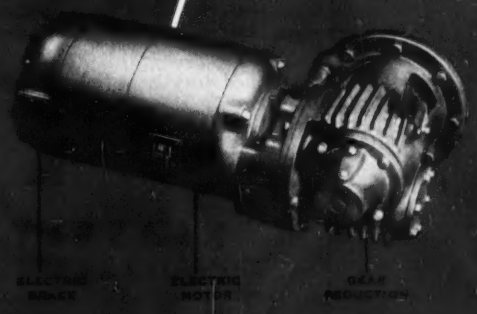
And nowhere else can you get anywhere near the wide range of selection that you have in MASTER Right Angle Gearmotors. They're available in sizes ⅛ to 25 Horsepower for all electrical specifications and in splash-proof, enclosed or explosion-proof construction. Gear reduction ranges up to 430 to 1 with the countershaft in either horizontal or vertical positions. In addition these gearmotors can be supplied with integrally built electric brakes . . . three types of variable speed units . . . and with fluid drive units for cushioned power.

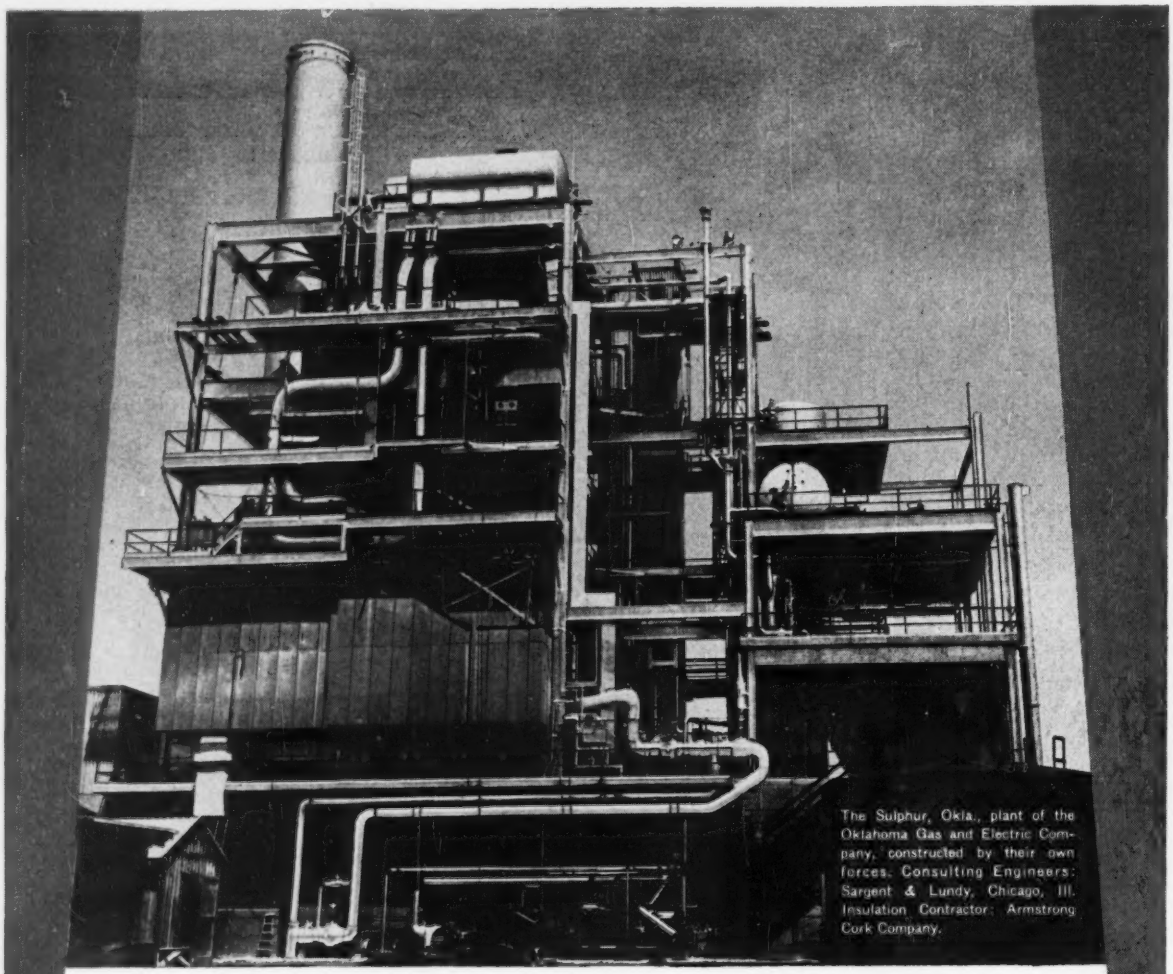
Try them . . . you'll find they're the horsesense way to get slow-speed horsepower.

THE MASTER ELECTRIC COMPANY

DAYTON 1, OHIO

you can't beat them for compact slo-speed power





The Sulphur, Okla., plant of the Oklahoma Gas and Electric Company, constructed by their own forces. Consulting Engineers: Sargent & Lundy, Chicago, Ill. Insulation Contractor: Armstrong Cork Company.

They chose "Featherweight"® 85% MAGNESIA

TO INSULATE HEATERS, EVAPORATORS & STORAGE TANKS

To make their Sulphur, Okla., plant as modern and efficient as possible, Oklahoma Gas and Electric Company sought a modern, efficient insulation material. They found it in "Featherweight" 85% Magnesia, and used it extensively throughout the plant to insulate heaters, evaporators, storage tanks, and other equipment.

"Featherweight" 85% Magnesia is effective where temperatures do not exceed 600° F. Used in combination with K&M Hy-Temp Insulation (diatomaceous silica) its range is extended to 1900° F.

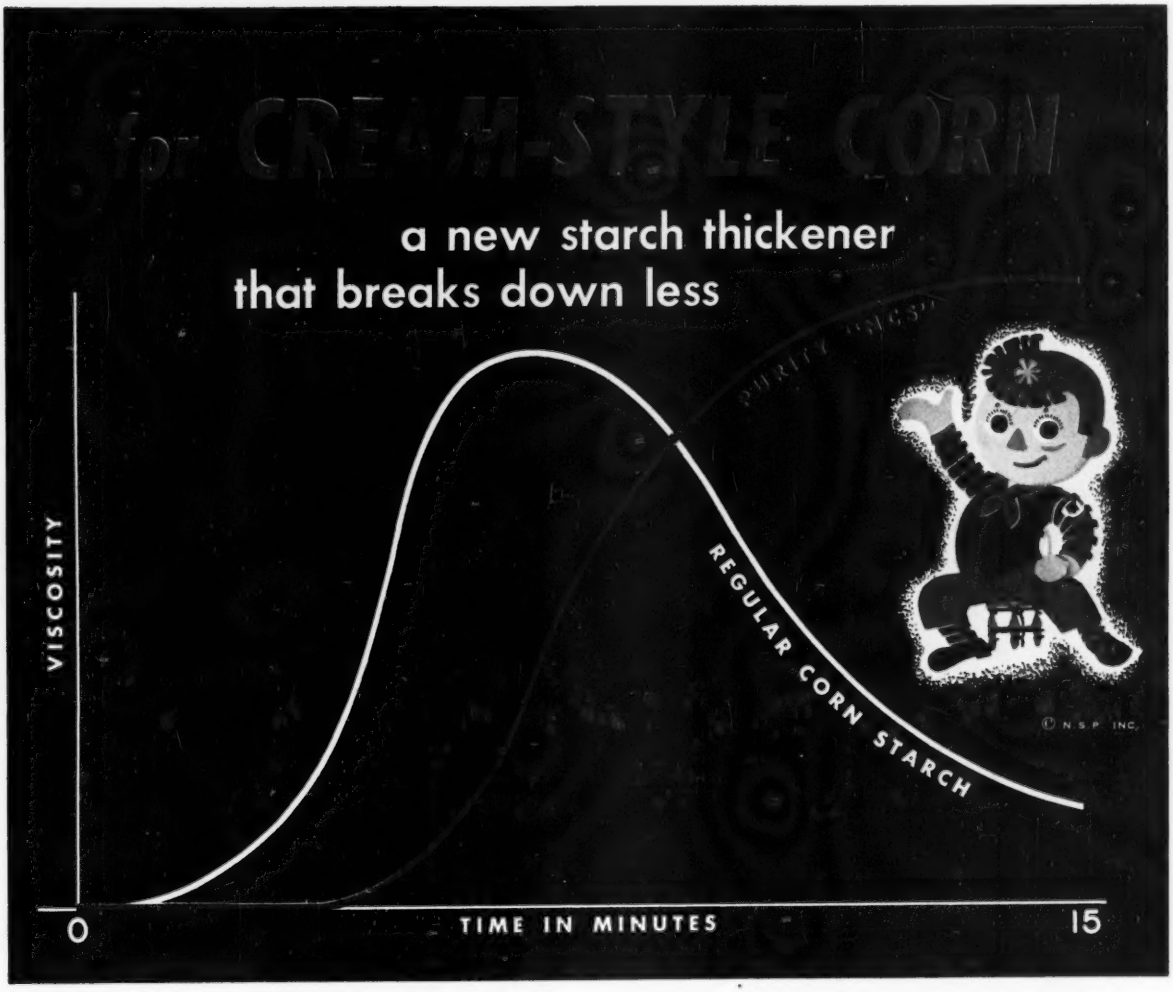
Hy-Temp is applied directly to the hot surface, and "Featherweight" is used as the second layer. The two layers are fitted with staggered vertical and horizontal joints—thus eliminating heat loss which occurs on single layer installations when the expansion of hot piping and equipment causes joints to open.

This K&M combination insulation will last the life of the equipment it serves, will withstand moisture, vibration, alternate heating and cooling, wetting and drying. Both materials are supplied in a variety of forms and thicknesses.

Your K&M distributor is an experienced applicator who will gladly give you more information about these heat-saving, money-saving K&M insulations. Or write directly to us.

Nature made asbestos . . .
Keasbey & Mattison has made it serve mankind since 1873

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA



PURITY "NCS" — a new starch that breaks down less at the high temperatures used in retorting — makes it easier for canners to get top quality packs with . . .

- Better flavor
- Better stability and longer shelf life
- Better color

HERE'S WHY — Regular corn starch gelatinizes completely in the kettle preparation. Then at the extremely high temperatures that are used in retorting canned products, it breaks down or thins out.

PURITY "NCS" cooks at a higher temperature than regular corn starch. It gelatinizes only partially in the kettle. Complete cooking takes place on retorting, with little breakdown, so that less PURITY "NCS" is needed. For example, in creamed style corn, 25-30 per cent less PURITY "NCS" is required.

For further information, clip and mail the coupon.

National
STARCH PRODUCTS

Address: 270 Madison Ave., NEW YORK 16; 3641 So. Washtenaw Ave., CHICAGO 32; 735 Battery St., SAN FRANCISCO 11; BOSTON, PHILADELPHIA, ATLANTA, HOUSTON, INDIANAPOLIS and other principal cities.

I'D LIKE TO *REDUCE BREAKDOWN* FE

Please send ☐ Technical data on PURITY "NCS"

☐ Sample ☐ Representative

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

 Use coupon on page 209.

New 1954 Chevrolet Trucks

New Power! New Economy! New Features you want!

New Chevrolet trucks for '54 are here to do your hauling or delivery job faster, more efficiently and more economically.

To begin with, they bring you thrifty new power in *all* models. You save time on every trip with extra reserves of high-compression horsepower under the hood—and you enjoy greatly increased operating economy as well.

In addition, these great new Chevrolet trucks offer new and even greater dependability with increased ruggedness throughout the chassis. You'll find heavier axle shafts in 2-ton models . . . bigger, more durable clutches in light- and heavy-duty models . . . more rigid frames in *all* models. Pickup and stake bodies are plenty rugged, too—and they're roomier for '54!

But that's only the beginning! You enjoy new cab comfort, convenience and safety. Instruments are easier to read . . . controls are easier to reach. A new one-piece curved windshield gives you greater visibility. The new Ride Control Seat* lets you drive in relaxed comfort hour after hour, over all kinds of roads. Seat cushion and back move as a unit to "float" you over bumps without back-rubbing.

In another great advance, new Chevrolet trucks offer you the last word in no-shift driving ease and convenience. With proved truck Hydra-Matic transmission* you can drive all day and make door-to-door deliveries without shifting or clutching. Fact is, there *is* no clutch!

These are some of the many big new benefits awaiting you in the new Chevrolet trucks for '54. Why not plan to get the whole money-saving story at your Chevrolet dealer's soon! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Most trustworthy trucks on any job!

CHEVROLET

ADVANCE-DESIGN TRUCKS

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

THREE GREAT ENGINES—The new "Jobmaster 261" engine* for extra heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. **NEW TRUCK HYDRA-MATIC TRANSMISSION***—offered on ½-, ¾- and 1-ton models. Heavy-Duty **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **DIAPHRAGM SPRING CLUTCH**—improved-action engagement. **HYPOID REAR AXLE**—for longer life on all models. **TORQUE-ACTION BRAKES**—on all wheels on light- and medium-duty models. **TWIN-ACTION REAR WHEEL BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—greater holding ability on heavy-duty models. **NEW RIDE CONTROL SEAT***—eliminates back-rubbing. **NEW, LARGER UNIT-DESIGNED PICKUP AND PLATFORM STAKE BODIES**—give increased load space. **COMFORTMASTER CAB**—offers greater comfort, convenience and safety. **PANORAMIC WINDSHIELD**—for increased driver vision. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—easier, safer handling. **ADVANCE-DESIGN STYLING**—rugged, handsome appearance. *Optional at extra cost. Ride Control Seat is available on all cab models, "Jobmaster 261" engine on 2-ton models, truck Hydra-Matic transmission on ½-, ¾- and 1-ton models.

MORE CHEVROLET TRUCKS IN USE THAN ANY OTHER MAKE!

TRADE PAPER EDITION
Published by
SCHUTTE and KOERTING
Company

ENGINEERING News

• HEAT TRANSFER EQUIPMENT • STRAINERS • CONDENSERS AND VACUUM PUMPS • OIL BURNING EQUIPMENT •
• VALVES • SPRAY NOZZLES AND ATOMIZERS • GEAR PUMPS •

Here's SK's NEWEST DESIGN for Rate-of-Flow Measurement— the SAFEGUARD ROTAMETER

As an answer to industry's increasing demands for *safety* and *convenience* in rate-of-flow measurement of liquids and gases, SK has designed its newest Rotameter—the Safeguard Rotameter.

This Rotameter has specific application for measurement in the higher temperatures and pressures of modern process technology, or where dangerous or valuable liquids and gases are being used.

FOR SAFETY:

The completely enclosed steel meter case has detachable safety glass windows, protects the metering tube from external shock, and also protects the operator if accidental tube breakage occurs.

FOR CONVENIENCE:

Wider front and rear sight glass windows give maximum visibility. The detachable metal reference scale can be supplied in either units of flow or in millimeters for use with calibration charts, as desired.

Extreme construction rigidity gives precise end fitting alignment, eliminates pipe stresses on the tube.

Can be adapted for remote recording and controlling of fluid rate of flow.

Write for full information, including sizes and capacities, on this newest Rotameter design.

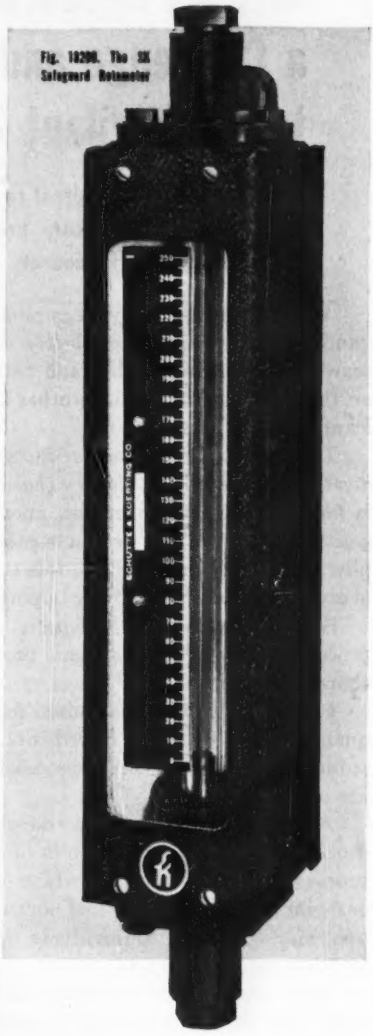


Fig. 18200. The SK Safeguard Rotameter

Glass metering tube has cylindrical inlet and outlet pieces of the *same outside diameter* — allowing use of the same size packing rings on either end of the tube.

Horizontal inlet and outlet can be connected in four different positions.

Two types of metal mandrel made tubes are available—the "HCF," a High Capacity Fluted tube, or the "R," a conical tapered tube without flutes.

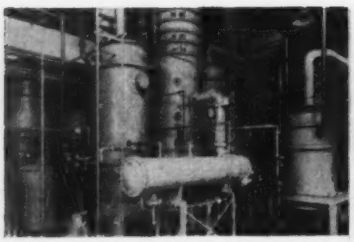
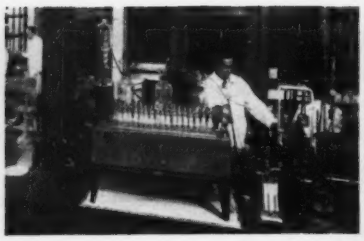
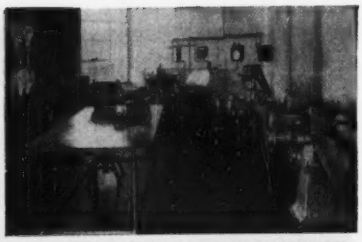
Various rotor designs and materials permit wide capacity range within one meter.

End fittings are available in cast iron, bronze, and stainless steel.

Neoprene packing gives corrosion resistance, tight seal, long service life. Other packing material is available.

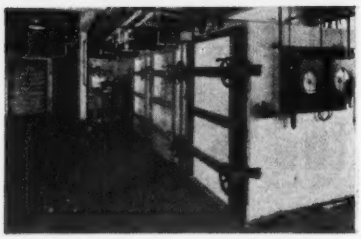
Rotor removal and tube cleaning without dismantling easily done through non-leaking seated clean-out plug.

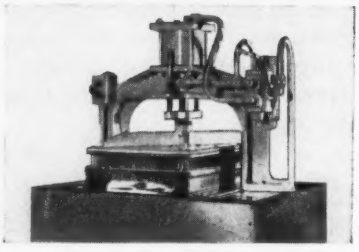
SCHUTTE and KOERTING Company
Manufacturing Engineers
25 STATE ROAD
CORNWELLS HEIGHTS
BUCKS COUNTY, PA.
Representatives in Principal Cities

Griffith Research Presents a Challenge and Big Opportunity to any Vigilant Buyer

Of special interest to you and every curing foreman, sausage maker, production superintendent, sales manager, treasurer, vice president and president.





WHATEVER his title, your purchasing agent plays a vital role in advancing the consumer popularity of your company's products. Ever searching for higher quality and better value in materials, he must be on the alert for—and inform other key men in management of—significant research developments.

The veteran buyer knows: *Rarely does research introduce an ingredient or process of revolutionary character.* His constant hope and search is for the slight improvement, another refinement, a series of steady gains. From such, your products gain an extra advantage in competitive quality or value, or both. Yet, it is the rare research development which is always a challenge and big opportunity for him.

Serving buyers in both respects, Griffith has a record unique in food processing research. Persistent, progressive, and highly diversified in character.

Griffith research is recognized for improvements in the quality and quality control of staple ingredients. For bettering food flavor. And, for reducing the time and cost of processing foods in which Griffith materials are used.

Among recent revolutionary developments are Griffith's PENETRONIC* process of "dry curing" bacon in just three days . . . Griffith's exclusive process of Spice Extraction, which controls the potency and uniformity of flavor in PEPPEROYAL** and SOLUBLIZED SEASONINGS . . . and Griffith's new Monoglyceride Antioxidants, the 100% oil-soluble stabilizers for lard and other edible fats.

These, and a score of Griffith products, will reward the vigilant buyer who looks to the food industry supplier that has the staff, experience and facilities for important research. He, and you, will look to the recognized source of more scientifically formulated and laboratory-controlled materials—The Griffith Laboratories.

*Trade Mark Reg.
**Patent Applied For

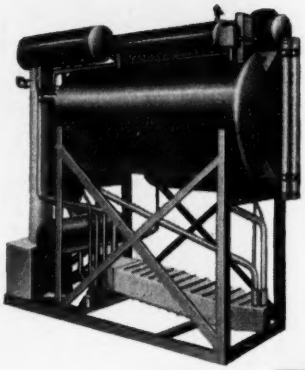
THE Griffith LABORATORIES, INC.

In Canada—The Griffith Laboratories, Ltd.

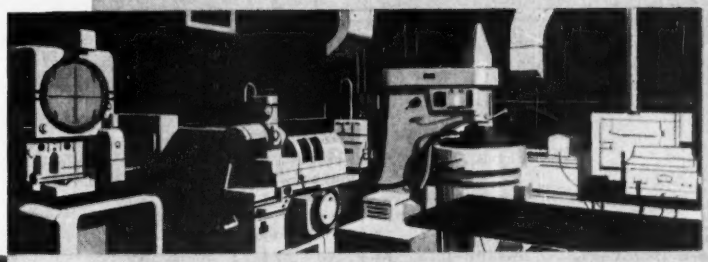
CHICAGO 9, 1415 W. 37th St. • NEWARK 5, 37 Empire St. • LOS ANGELES 58, 4900 Gifford Ave. • TORONTO 2, 115 George St.

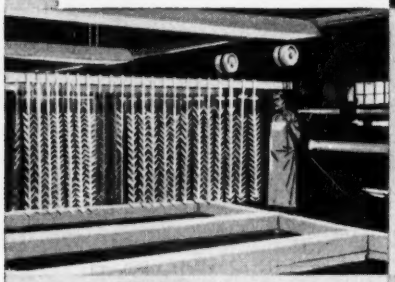
Laboratorios Griffith do Brasil, S.A.—Caixa Postal 300 Mogi das Cruzes, Est. S. P., Brasil

use WASTE HEAT to control HUMIDITY and TEMPERATURE



Servel 25-ton Water Chiller
No moving parts. Operates continuously at peak load with minimum maintenance on steam from any source.





Industrial Precooling

Use Servel Water Chillers to precool air and increase capacity and improve performance of compressors and internal combustion machines. Opportunities for varied and profitable use are practically unlimited!

Process Cooling

Continuous high efficiency and dependability makes Servel Water Chiller ideal for process cooling. Temperatures of liquids can be closely regulated and held to precision limits in manufacturing and formulating processes.

Air Conditioning

Here's economical temperature and humidity control. Water is used for refrigerant. No compressors! Units may be placed for efficient zone control. Frequently, costly duct work can be completely replaced by simple piping arrangements.

The Servel absorption principle lets you use waste heat (or steam, from any source) to chill water for air conditioning or other cooling needs.

The flexibility and operating efficiency of the Servel Water Chiller is unmatched. *No moving parts design* means quiet, vibration-free operation, low upkeep. Capacity can be reduced by 50% with corresponding power savings. Compact size and low floor loading permit single or multiple installations in most advantageous locations.

Your investment is protected by a full five-year factory warranty!

Check these advantages against *your* cooling requirements. Your Servel dealer will supply details and engineering assistance, or mail coupon today!

Send coupon for details!

Servel

the name to watch for great advances in
AIR CONDITIONING ✓ REFRIGERATION

SERVEL, INC., DEPT. FE14, Evansville 20, Indiana

Send me specifications and full information on Servel Water Chillers.

Name_____

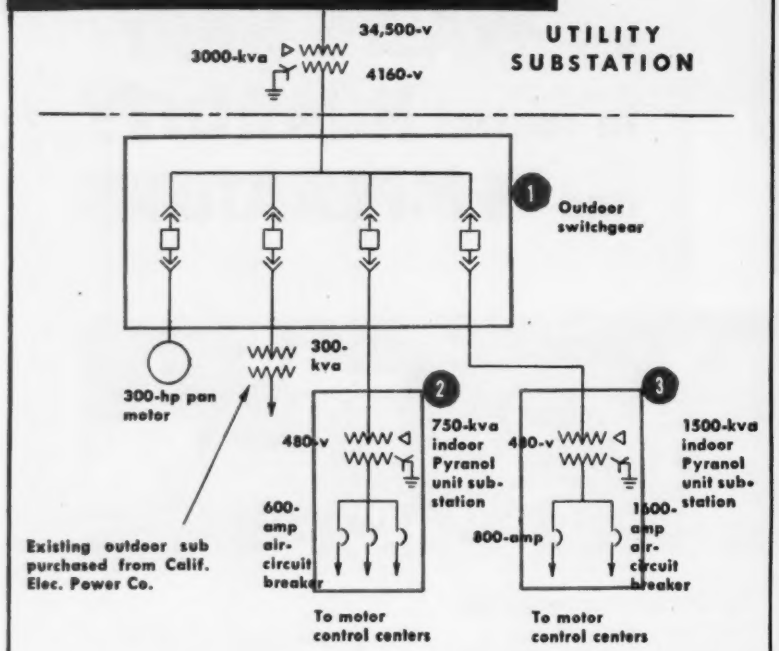
Firm_____

Address_____

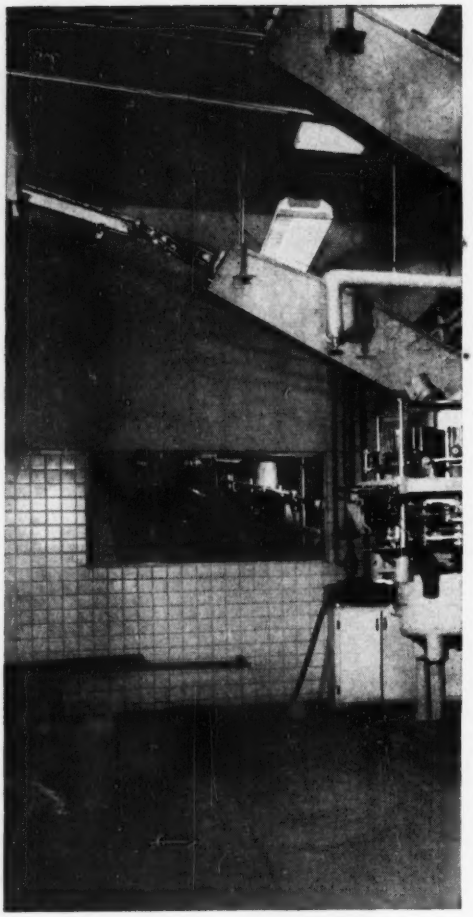
City_____ Zone___ State_____

Use coupon on page 209.

ENGINEERING REPORTS:



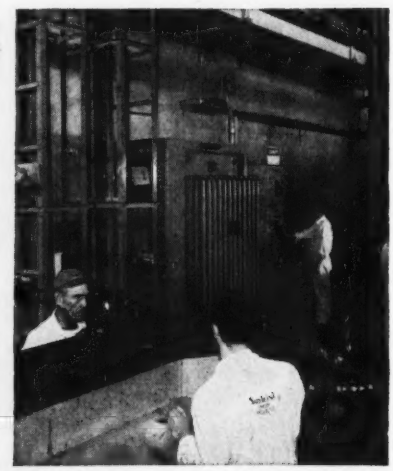
4160- and 480-volt systems neutral grounded to limit possible overvoltages from ground faults



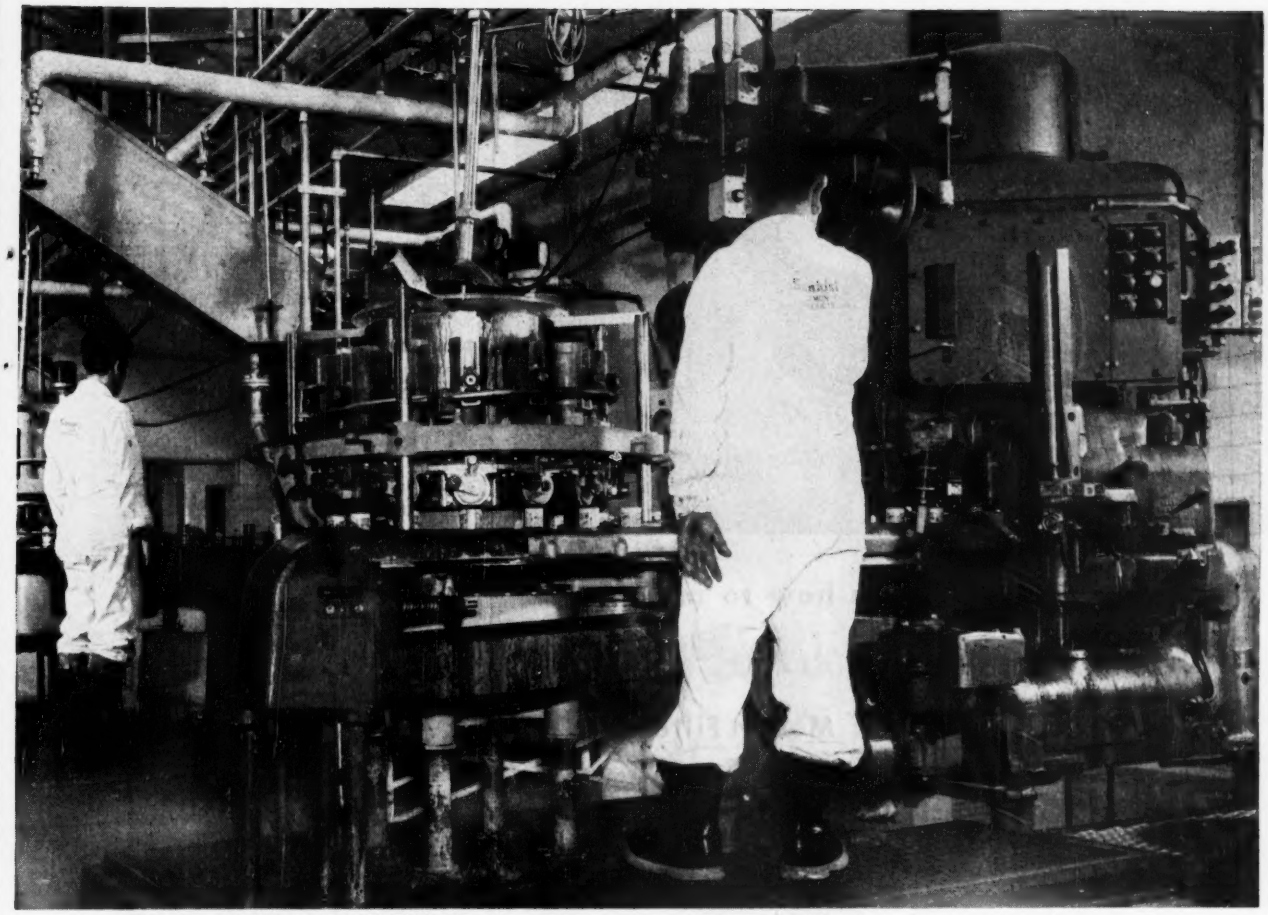
Planned power system makes it easy

1 Compact, accessible G-E metal clad switch gear distributes high-voltage power to plant. Result: no voltage drop problems, major power savings.

2 750-kva "Building Block" G-E unit substation (background) was easy to install. It was delivered factory-assembled and tested, ready to be set in place.



3 1500-kva unit substation, located near processing line, shortens costly low voltage branch circuits. Drawout circuit breakers simplify maintenance.



BETTER PRODUCTION CONTINUITY for these two sealing machines at Exchange Lemon Products results from the full voltage delivered by one of the G-E unit substations. Full voltage at utilization points provides adequate motor starting torque, normal loading without excessive currents, and full illumination for plant lighting.

for juice extraction plant to expand

Exchange Lemon Products Co. lowers expansion costs with G-E radial power distribution system

Thanks to *system planning*, Exchange Lemon Products Company's juice plant at Corona, Calif., can expand steadily and not outgrow its basic electrical system.

At present, this growing affiliate of Sunkist is processing more than 1500 tons of lemons each day. To handle the heavy electrical loads that have developed, Exchange engineers and General Electric Food Industry specialists worked out a co-ordinated low-cost radial distribution system built around G-E load center unit substations. To keep up with future expansion at minimum expense, additional unit substations can be added like building blocks. This has kept investment low by avoiding purchase of unnecessary transformer capacity.

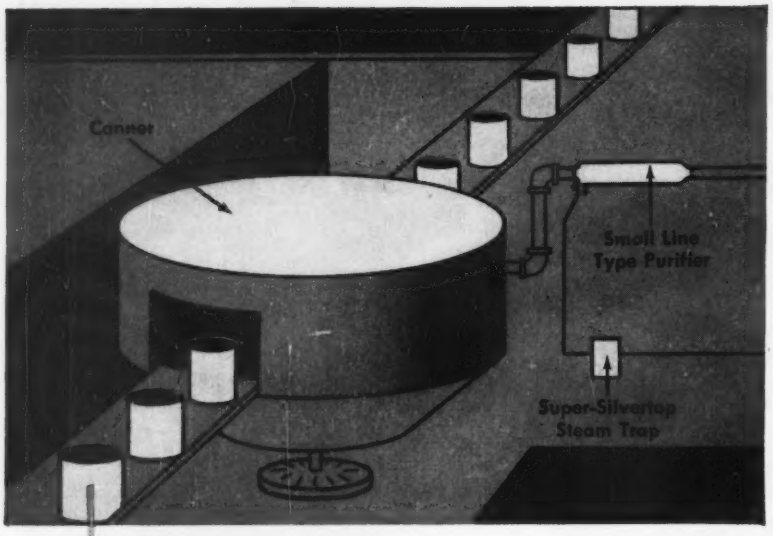
Strategically located throughout the plant, these G-E unit substations play a key part in keeping the length of costly low voltage feeders to a minimum and reducing the short circuit interrupting duty on feeder breakers while delivering full voltage all along the line. High voltage lines that supply the substations can be extended as the plant grows to tie in additional load centers. The need to run individual feeders all the way back to incoming power can be avoided.

If power loads in your plant are increasing, you probably stand to profit by planning a new power system. Talk it over with your G-E Apparatus Sales Representative—find out how step-by-step modernization with G-E load center substations can spread out costs, prevent production interference. General Electric Company, Schenectady 5, New York. 652-14

Engineered Electrical Systems for Food Plants

GENERAL ELECTRIC

 Use coupon on page 209.



This booklet shows how to make

Canning Steam absolutely clean!

without the use of Messy Filters

● Make canning steam clean and dry this simple, easy way. First, write for a copy of this book. It tells how Hi-eF Purifiers are high-efficiency type purifiers, guaranteed to keep virtually 100% of all dirt and moisture out of steam shot into cans. Without messy filters or moving parts they separate out all dirt and moisture. Your maintenance man never inspects them, takes them apart or replaces cartridges, as they are fully automatic. Their method of operation and uses in the food field are described in Bulletin 700. Write for your copy today.

MAIL COUPON FOR FREE COPY

ANDERSON Hi-eF PURIFIERS

The V. D. Anderson Company
1995 West 96th Street, Cleveland 2, Ohio
Without obligation please send the following
☐ Bulletin 700 (Hi-eF Purifiers for Canning Equipment)
☐ Bulletin 401 (Hi-eF Purifiers for Evaporators and Concentrators)
☐ Prices

Name.....
Company.....Title.....
Address.....
City.....State.....

BY THE MAKERS OF SUPER-SILVERTOP STEAM TRAPS

Tomato Operation

—*Continued from page 82*

slip them off. Following this "hot break", the product is cooled with water, then drops to the grading and filling conveyors.

Selecting tomatoes for various grades of solid or whole-pack requires experienced operators. Most of the women employed are local housewives who return, each season. When tomatoes are of best quality, most of these operators are selecting, coring, and packing whole fruit. As the season wanes, that segment of operators packing this product gradually moves toward the scalder. Finally there remains only a sorting crew, removing any product that may have passed the sorting conveyor. At this time, all tomatoes move into the grinders and are subsequently made into puree, catsup, paste, or sauce.

All packing lines are equipped with the labor-saving Albertoli can systems. Comprised of two conveyors, upper and lower, which are connected at each end, the system provides a constant and individual supply to each operator. Cans enter this "merry-go-round" and ride on the belt to the upper conveyor. At its end they make a 180 deg. turn and are rolled along the run by a belt, which now rides atop the cans. Exits off the conveyor run directly above each operator's station to feed cans to chutes, supplying her needs. Each chute holds 3-4 cans, according to size. When the system is completely filled and electrically operated, a gate stops the flow from the empty can conveyor, while cans in the system move around the merry-go-'round. When there are none returning from the lower to the upper conveyor, the gate opens to permit flow from empty can conveyor.

Each chute is equipped with a rotary can marking device that may be adjusted to print symbols of any one of three grades. It also prints the operators' numbers. Thus, when the cans emerge from the cookers, they are separated as to various grades, then labeled and cased. In addition, the operators' numbers make possible easy checking of piece work done by each woman.

As cans drop into the chutes, they make a turn, putting the open end within easy grasp of the operator. Because they do not have to select cans visually, operators center all their attention on the product moving across the belt. This aids in rapid selection of the grade of tomatoes they are filling.

Thus the system, in addition to saving labor by moving empty cans to,

Testing Brine Strength through the Ages...

or

"FROM LOTUS TO LIXATE"

TODAY, brine is a precision ingredient with hundreds of exacting uses in industry. Its strength must be accurate, controlled, and constant.

A simple Lixator installation solves this age-old problem—makes uniform brine automatically.

It cuts handling and labor costs—delivers a steady flow of pure, 100% saturated brine to any point in your plant at the twist of a valve. You use STERLING ROCK SALT—and gravity does all the work. Automatically. Instantly.

The LIXATE Process is adaptable to your particular requirements. Write, and our representative will show you how. No cost, no obligation.

•

INTERNATIONAL SALT COMPANY, INC.

INDUSTRIAL DIVISION—SCRANTON 2, PA.

SALES OFFICES:

Atlanta, Ga. • Chicago, Ill. • New Orleans, La. • Baltimore, Md. Boston, Mass. • St. Louis, Mo. • Newark, N. J. • Buffalo, N. Y. New York, N. Y. • Cincinnati, O. • Cleveland, O. • Philadelphia, Pa. Pittsburgh, Pa. • Richmond, Va.

ENGINEERING OFFICES:

Atlanta, Ga. • Chicago, Ill. • Buffalo, N. Y.

2500 B.C. LOTUS SEED TEST

1500 A.D. EGG TEST

1800 A.D. SALOMETER TEST

1954 A.D. NO TEST

(not needed with Lixate Brine)

TO BEVERAGE & FOOD PRODUCERS

Wyandotte products will do every cleaning and sanitizing job in your plant better, with the lowest use-cost! Let us prove it!

Cleaners for

- tanks, vats, lines, pumps
- bottle, jar and can washing
- lugs, hampers, cases
- pasteurizers, condensers, filter-masses
- conveyors, flumes, fillers
- all other equipment and utensils in all food and beverage plants

Processing materials for

- both general and cooling water treatment
- fruit and vegetable washing, peeling, rinsing

Maintenance cleaners for

- floors, walls, ceilings, drains. Also a floor-absorbent—Zorball.

Germicides, sanitizers, disinfectants, fungicides, deodorants

Wyandotte is the largest manufacturer of specialized cleaning products for business and industry. Product development is carried on continuously in our new Research Laboratories. In the Bacteriological Laboratory, for example, tests and evaluations are made of products for controlling bacteria, yeasts, fungi, protozoa and algae. Other research is concerned with particular problems of scale removal and prevention.

The Wyandotte organization — research, production, sales—is well equipped to serve you. The representative who calls on you has a thorough, practical knowledge of cleaning and sanitizing. He will give you valuable assistance in maintaining the highest sanitation standards *at low cost*. You are under no obligation for this service in your plant. For better cleaning, lower costs, call your local Wyandotte man or mail the coupon today! *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Angeles 12, Calif.*

Wyandotte CHEMICALS

Helpful service representatives in 138 cities in the United States and Canada

Largest manufacturers of specialized cleaning products for business and industry

Wyandotte Chemicals Corporation
Department 2184
Wyandotte, Michigan

☐ Please send free technical information on Wyandotte cleaners and sanitizers for use in

_____ (machine or process)

☐ Please have a representative call.

Name _____

Firm _____

Address _____

City & Zone _____ State _____

and filled cans from, the packing belt, also increases efficiency of the filling operation.

Filled cans are placed on a third conveyor leading to the can seamers. Closed cans then move into the continuous, agitating cookers.

Other Products

Tomatoes not used for the solid pack flow over the end of this grading conveyor into the grinder. Pumps pick up the pulp, pass it through a magnetic separator, and thence it goes to the preheaters. Here, the temperature is raised to facilitate subsequent pulping and finishing, and the product flows into an intermediate storage tank that feeds the vacuum evaporator tanks.

Normally, product from these tanks flows direct to the vacuum pan. However, if production is greater than capacity of the evaporator, pulp is valved to heat storage tanks, where its temperature is maintained, and thence it goes to the pan. (These tanks have copper heating coils and are also used in the manufacture of tomato catsup.)

Tomato pulp, at a temperature of 175-190 deg. F., is drawn into the first effect of the double effect evaporator, where it is circulated through a tubular steamchest—a horizontal, multipass unit. It is discharged into the vapor chamber behind a baffle, preventing entrainment losses. The heater increases temperature of the pulp approximately 10 deg. F., producing flash evaporation as it discharges into the first effect. Temperature here is normally 185-190 deg. F.

A pump, powered by a steam turbine, circulates the pulp through this unit. Steam at 15-20 psi. from the turbine is subsequently used as a heating medium for the steam chest.

The second effect steam chest is a natural circulation unit, operating on the thermosiphon principle and heated by vapors from the first effect. It discharges heated liquid and vapor through a centrifugal nozzle into the second effect of the evaporator. Temperature in this unit is usually 125-130 deg. F. Vapors pass directly to a barometric condenser. Vacuum is maintained with a steam-jet ejector.

By using first effect vapors to heat product in the second effect, steam consumption is reduced to approximately 50% of that of a single effect unit. When evaporating 18 tons of tomato pulp an hour (5-8% solids), this evaporator will require about 12,500 lb. steam. Also needed is 540 gal. of 70 deg. F water a minute.

Long periods of operation are possible with this type of unit before cleaning is necessary. In some cases, units have been operated for 200

...for the HIGHEST QUALITY in Sanitary Stainless Steel Fittings · Valves · Pumps and Tubing...

Try TRI-CLOVER

Compare these fitting features...

- **FABRICATED FROM TOP QUALITY STAINLESS STEEL**
- **FULL CORROSION RESISTANCE**
- **ALL FITTINGS MEET OR *EXCEED* 3A STANDARDS**
- **SWEEP CONSTRUCTION — FULL FLOW — NO CREVICES**
- **CLEAN — SQUARE CUT ACME THREADS**
- **ACCURATE, SMOOTH FINISH BEVEL SEATS**
- **TRUE O.D. DIMENSIONS — POSITIVE ALIGNMENT**

For "C-I-P" LINES

Tri-Clover offers the complete "TRI-CLAMP" line of fittings and valves, for cleaned-in-place installations. These fittings, in sizes from 1½" through 4" O.D., are simple, fast and economical to install, and are thoroughly proved in service.

To convert existing Acme thread fittings to C-I-P service, a simple, positive Super Speed Conversion Tool is available.

See your nearest TRI-CLOVER DISTRIBUTOR

EXPORT DIVISION:
8 So. Michigan
CHICAGO, U.S.A.
Cable: TRICLO, CHICAGO

These features are representative of the extra measure of quality you get when you standardize on TRI-CLOVER Stainless Steel Fittings, in sizes from 1" through 4", for your sanitary lines. These same high standards of quality and performance apply equally well to the complete line of valves, pumps, tubing and specialties which Tri-Clover has furnished to the food, dairy, beverage and brewing industries for over thirty years.

For *one* quality source of supply for *all* your sanitary line requirements, be sure to specify TRI-CLOVER.

See the Tri-Clover Booth D-24 at the Canning Show

Tri-Clover®
MACHINE CO.
Kenosha, Wisconsin

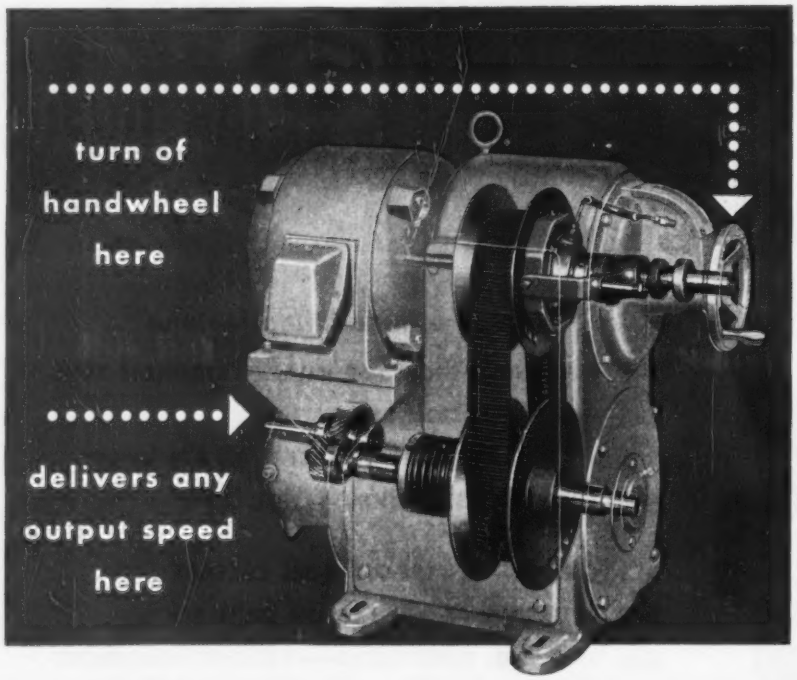
TRIALLOY AND STAINLESS STEEL SANITARY FITTINGS, VALVES, PUMPS, TUBING, SPECIALTIES

THE Complete LINE

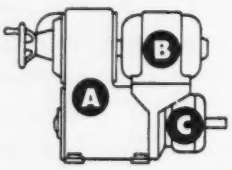
FABRICATED STAINLESS STEEL INDUSTRIAL FITTINGS AND INDUSTRIAL PUMPS

S154

Simplify your speed-changing methods with Reeves Vari-Speed Motodrive®



A complete, variable speed power plant in one, compact package that releases the *full* profit potential of every machine . . . every operator



REEVES Vari-Speed Motodrive incorporates (A) REEVES speed-changing mechanism, (B) any standard, constant-speed motor, and (C) gear reducer in a single, space-saving unit easily applied to any machine. Turn of handwheel or touch of button delivers any desired speed—instantly, accurately, *positively*—without stopping the machine. Widens machine work range; increases rate and quality of production; and utilizes highest skill of operator. Specify REEVES Vari-Speed Motodrives for the machines you build or buy. Sizes to 30 hp; speed ratios as great as 10 to 1. Send for free catalog to Dept. FE14-G.

REEVES PULLEY COMPANY • COLUMBUS, INDIANA
Recognized leader in the specialized field of variable speed control

REEVES Variable Speed Drives
for *accurate* speed control

hours without stopping for clean-up.

There is no accumulation of empty lug boxes in areas where they might become an accident or fire hazard.

Empty boxes are conveyed from the dumpers by a series of long, overhead conveyors to two points outside the plant. A relatively small number are routed to the raw-material receiving yard, the remainder being automatically conveyed to the empty box storage yard.

It is from this latter point that trucks, after discharge of their full loads, re-load with empties and return them to the fields. Boxes are manually stacked upon pallets and fork-lift trucks then load these upon the trucks.

End (*Resume reading on page 86*)

Full Flavor Concentrate

—*Continued from page 57*

to operating temperature of the evaporator in which juice is to be concentrated.

Cooling and flashing are aided by recirculation of a portion of the cooled juice. The unique recirculating method has the additional advantage of preventing foaming. Lower section of flash chamber is extended to provide a feed surge-tank to supply evaporator.

Retention time of juice in evaporator is reduced to a minimum through use of a unit of "falling film" type. This type evaporator not only removes any possibility of juice overheating, but also reduces to a minimum the volume of juice in the system.

Minimum operating level in evaporator is automatically maintained by a pneumatic, differential-pressure type instrument that throttles an air-operated, diaphragm-type juice-feed valve at the inlet to the evaporator. Juice is recirculated in the unit by a pump, a portion being withdrawn at desired product density and then delivered to storage.

Since essence solution is stable and free from deterioration in normal storage, volatile aroma and flavor constituents may be added to the concentrate at the time of packaging.

End (*Resume reading on page 58*)

High Frequency Cooking

—*Continued from page 53*

Their theory is that increase in thermal energy is not due here to molecular polarity friction, as in dielectric heating. Rather, it is due to a combination of this with changes in particle momentum resulting from

THE MAN BEHIND THE TEST TUBE

In the inexorable course of the centuries, many idols fall by the wayside. Each era specializes after its own fashion, and in the birth and death of ideas contributes to the cumulative knowledge that is our cultural heritage. The 20th century hero wields neither the sword of conquest nor the pen of philosophy. Rather, he opens the pages of Time's volume of knowledge and with infinite patience, slowly extends its cover. He is neither poet nor lawyer, soldier nor statesman, but in his own way an unique combination of all. Standing firmly upon the achievements of the past, he thrusts a questing arm into the dim future, seeking to dispel the shadows of human fear with the courage of understanding. He is the "man behind the test tube" . . . the research chemist.

OUR 154th YEAR OF SERVICE

D&O

DODGE & OLCOTT, INC.

180 Varick Street • New York 14, N. Y.

Sales Offices in Principal Cities

ESSENTIAL OILS • AROMATIC CHEMICALS • PERFUME BASES • FLAVOR BASES • VANILLA

9,000,000 reversals of potential per second. This continuous increase in translational motion results in equivalent increase in kinetic particle energy throughout the mass, which in turn creates a temperature rise.

Since the effect, then, is not unlike temperature produced in a patient by medical diathermy, they prefer to call this new method of inducing temperature in food "Di-Thermal" processing.

Working Arrangement

Let us now turn to the experimental working set-up developed for "Di-Thermal" processing. For while rudimentary in design and use, it more than hints at eventual commercial operations.

Source of high-frequency energy was an industrial-model oscillator rated at 15 kw. at 2.5 megacycles, and adjustable from 2.5 to 10 mc. Most tests were made at 9 mc.

Data on the electrical properties of pork luncheon meat permitted design of a processing cell consisting of a 24-in. long, 4-in. diameter, flanged borosilicate glass tube, with ⅜-in. stainless steel end-plate electrodes.

Product was packed into this cylinder and sealed, then the cylinder was clamped to connectors inside a shielded vessel and subjected to 9,000 v. at 9 mc. Foundation Engineer Pircon currently is experimenting with a similar cell, of 4-in. diameter and 6-in. length, for processing boned hams.

In addition to various simulated container-type cells—which would represent an approach to in-can processing—a continuous process unit was also designed.

Essentially, this continuous heater consists of a nylon screw inside a 4-in. copper pipe. A solid-copper coupling in the center of the nylon shaft is covered with aluminum foil, and this acts as one electrode, with the pipe as the other.

In order to increase resistance to current in more conductive foods, this continuous unit was modified with two copper rings as electrodes, these being separated by a length of glass piping. This assembly is located concentric to the nylon shaft, with rings at each end of the foil. Hence the current path runs from generator to first ring, through product to foil, along foil, through product to second ring, then to ground.

Two striking advantages were immediately apparent in "Di-Thermal" cooking: (1) Process time could be amazingly shortened, and (2) products made by the new method invariably seemed "improved."

Take a typical luncheon-meat run. At a starting temperature of 51 deg. F., it took only 2.9 min. to raise a 10-lb. batch to 199 deg. F. Similarly, it was found possible to raise a 11-lb. cured ham from room temperature to 250 deg. F., and to achieve complete sterility, in less than 18 min.

In subsequent evaluation by taste panels, the luncheon meat usually rated well over its commercial canned equivalent. The cooked ham—a sterile product—compared favorably in texture and flavor with commercial canned hams—in which sterility cannot be achieved.

But, it can be argued, the expensive equipment and power costs are still there.

True, even with the improved process cell, the average conversion efficiency of electrical power to heat was only about 56%. But when this is worked out, it is seen that a 15-kw. generator will process 3,527 lb. of meat in an 8-hr. day, at a cost of about $0.00328 a pound. The equivalent cost for steam is $0.00118 per pound*.

Further, since electricity comes on a sliding scale, a larger operation would be less costly. Also, engineers now studying the conversion problem hope someday to achieve 75% efficiency, which might place steam on the losing side.

The generating equipment still is fairly expensive and of limited capacity. However, it is believed that specific design and commercialization of this equipment not only could reduce cost, but also could develop tandem lines to handle larger production.

Problems and Processes

A major problem in adapting "Di-Thermal" processing to canning lines is the need for a suitable container that either will fit into, or act as, a processing "cell."

First of all, the container must be of regular shape, preferably with a round cross-section (more heat tends to be generated in the narrow sections of irregular cans).

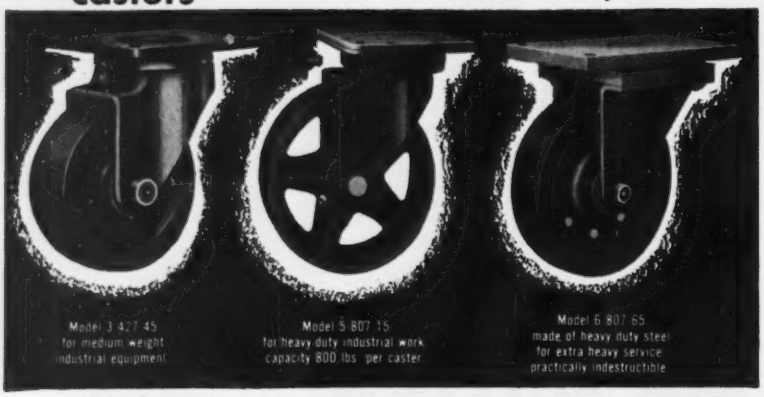
Even more of a problem is the fact that conventional all-metal containers will not work due to shorting between the caps and the metal wall. So some sort of barrier to this shorting, or a change to metal-ended plastic containers, may prove warranted. Current studies, particularly on sterile canned ham, indicate that this problem can be solved.

Of course, preformed or prebagged

* Based on electrical rate of 2.25¢ per kw.-hr. and Btu. costs for steam from an efficient boiler system.

FAST... EFFICIENT materials-handling with Colson® casters

There's a COLSON Caster designed to meet every industrial materials-handling requirement—*exactly.* Old, bumpy hard-to-handle equipment can be restored to its original efficiency quickly and economically with COLSON Casters. Other COLSON materials-handling equipment includes hand trucks, barrel and drum trucks, platform trucks and lift-jack systems. Write us or consult the yellow pages (under "Casters" or "Trucks, industrial") for the COLSON office near you.


Model 3 427 45
for medium weight industrial equipment
Model 5 807 75
for heavy duty industrial work capacity 800 lbs. per caster
Model 6 807 65
made of heavy duty steel for extra heavy service practically indestructible

Write for new catalog "COLSON Trucks and Casters"

THE COLSON CORPORATION
ELYRIA, OHIO
CASTERS · LIFT-JACK SYSTEMS · INDUSTRIAL TRUCKS

Big new oil presses run smoother with TIMKEN® bearings taking heavy thrust loads

THESE big French Oil Mill Machinery Company presses produce vegetable oil at high production rates in a Southern oil mill. A feed screw and discharge screw are used to extract the oil from the cottonseed.

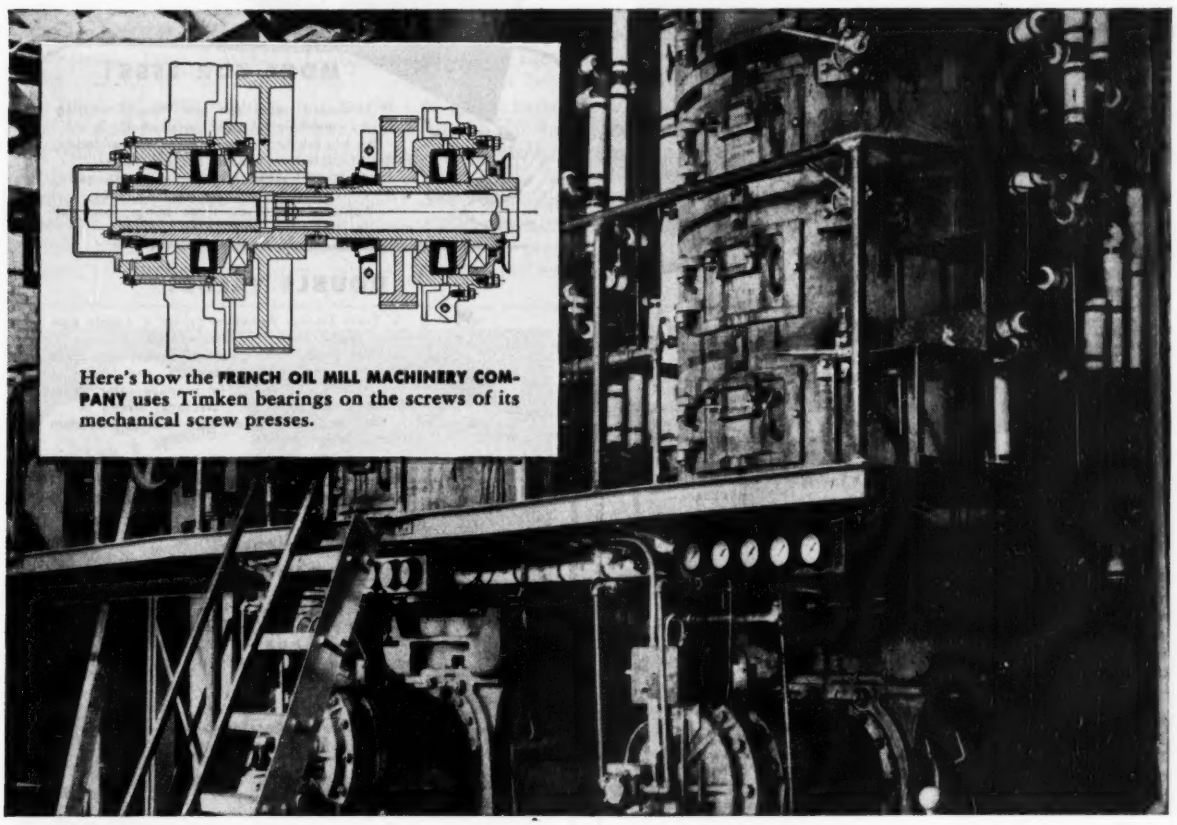
The action of the screw results in heavy thrust loads. Ordinary thrust collars would set up too much friction, so the French Company uses two Timken® on-apex tapered roller thrust bearings.

Timken bearings eliminate metal-to-metal rubbing action and cut friction way down. They *roll* the load. As a result, presses run smoother, last longer, require less maintenance.

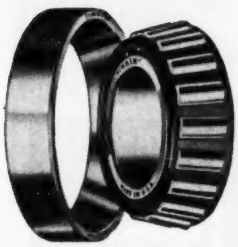
The French Company also uses Timken tapered roller bearings in the drive of this mechanical screw press to insure accurate gear mesh and a smooth flow of power. Line contact between rollers and races gives Timken bearings extra load carrying capacity assuring longer life with trouble-free performance. And, made of Timken fine alloy steel, they're case hardened to give a tough, shock-resistant core and a hard, wear-resistant surface.

Timken bearings are a sure sign of quality on the equipment you buy, the equipment you build. Always look for the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



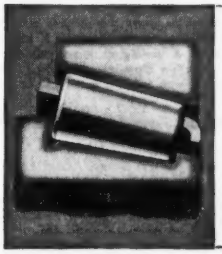
Here's how the **FRENCH OIL MILL MACHINERY COMPANY** uses Timken bearings on the screws of its mechanical screw presses.



TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

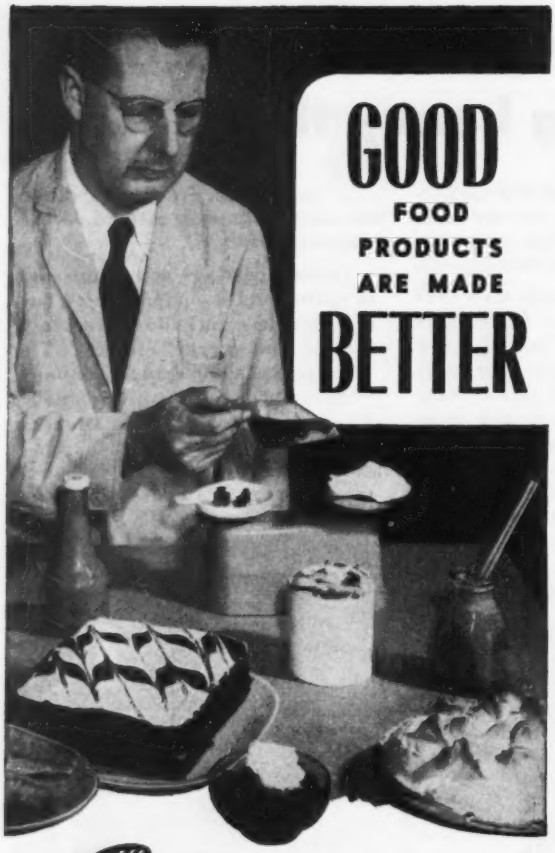


GREATER LOAD AREA

Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer. The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis Timken steels.

NOT JUST A BALL ◯ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬬ BEARING TAKES RADIAL ⬮ AND THRUST →⬮← LOADS OR ANY COMBINATION →⬮←

Use coupon on page 209.



GOOD FOOD PRODUCTS ARE MADE BETTER

with SeaKem "COLLOIDS OUT OF THE SEA"*

Does your product have all the appetite and sales appeal it needs? . . . Can your manufacturing process be simplified or speeded up? . . . Has a really tough improvement problem got you ready to throw in the towel?

Then it's time right now to discover how SeaKem Stabilizers can help you.

The check list at right shows a few of the positive ways these remarkable colloids are improving dozens of items as widely varied as bakery product stabilizers, chocolate milk, dessert mixes, ice cream stabilizers, pet foods, pie fillings (fruit), puddings, sauces, sausages, and syrups.

Whatever your food product may be, if the function you are interested in is listed, it will pay you to get full information on SeaKem "Colloids Out of the Sea". For prompt, non-obligating recommendations, just write outlining your problem.

Here are a few of the functions being performed by SeaKem Stabilizers for an ever-growing list of food products:

- Binding
- Bodying
- Emulsifying
- Gelling
- Modifying
- Stabilizing
- Suspending
- Thickening
- Custardizing milk and products containing milk solids
- Improving mouth feel and flavor
- Increasing efficiency of component ingredients
- Modifying ice crystal growth
- Physical and anti-oxidant protection

* SeaKem is the registered trademark for the standardized, water-soluble, sea plant extractives manufactured by the Seaplant Chemical Corporation. Refined by rigidly controlled processes which insure dependable uniformity and purity, SeaKem "Colloids Out of the Sea" are light amber to colorless, free-flowing flaky powders. Available in a variety of types suitable for use in either dry or liquid applications, SeaKem Stabilizers have won acceptance on the basis of proven advantages with leading food manufacturers and processors.

Send for latest SeaKem Technical Bulletins

SEAPLANT CHEMICAL CORPORATION
63 David St., New Bedford, Massachusetts

CUT PACKAGING COSTS!

use FINDLEY service-tested ADHESIVES

MORE FOR LESS!

✓Producing more for less through cutting costs by maintaining peak production, is the big job facing every manufacturer today. Faster, trouble-free production and better, more attractive products and packages spell P-R-O-F-I-T-S. Because every Findley Adhesive gives you these things, you get more for less.

DOUBLE VALUE!

✓Every Findley Adhesive carries a double barreled load! First, they assure faster trouble-free production, greater mileage, less down time for handling and clean up, and fewer rejects. Second, they produce safer, more attractive packages . . . packages strong in shelf appeal . . . packages that spell freedom from damage claims.

FOR EVERY PACKAGING APPLICATION

✓There's a Findley Service-Tested Adhesive for every packaging, labeling and converting need . . . for every stock and finish . . . to work on all types of equipment.

PERFORMANCE INSURANCE!

✓ For over 45 years leading manufacturers have banked on Findley service and experience to help them cut costs. The entire Findley organization is at your service to help you cut costs. Call . . . wire or write.

plants at MILWAUKEE AND HOUSTON
sales offices in CHICAGO, KANSAS CITY, NEW ORLEANS, DALLAS, HOUSTON, MINNEAPOLIS, KALAMAZOO, LOUISVILLE, AND OGDEN, UTAH

Findley's INDUSTRIAL ADHESIVES exclusively

THE F. G. FINDLEY COMPANY • 3043 W. PEMBERTON AVENUE • MILWAUKEE 10, WIS.

solid items could be arranged to pass through a "Di-Thermal" process cell and then into a sterile container under aseptic conditions.

Use of the continuous process for materials that can be moved through pipe and filler also is seen as a possible important contribution to aseptic canning of the Martin-system type. This holds particularly for thermolabile foods that require very critical temperature control.

So in visualizing possible use of "Di-Thermal" processing in future canning lines, this hypothetical picture roughly comes to mind:

In solid-pack can lines, a small shielded multi-section cabinet might be fitted over a widening conveyor between sealer and caser. Several parallel rows of plastic-sided, metal-ended containers would file into the openings of this cabinet, and overhead pistons might be used to clamp each can-end in place ready to receive the electrical "dose." Average treatment per can might take 2 or 3 min.

Juice and puree canning lines might be located in another area. Here, raw product could travel through a parallel group of small, compact, expanded pipe sections where a "Di-Thermal" process would be applied continuously. Sterilized product would continue on through pipe to an aseptic canning system for sterile filling.

There are, undoubtedly, many flaws in the above oversimplified picture. But it is suggested simply to imply that ingenious mechanization will inevitably follow, if and when this new unit operation merits wide commercial use.

End (Resume reading on page 54)

Orchard to Cannery

—*Continued from page 59*

ing the empties, at a rate of about 45,000 lb. of fruit per hour. This amounts to 6,430 lb. of fruit per-man per-hour. The crew usually comprises two lift truck operators, two dumpers, two men stacking empties, and a hand-lift operator.

When cherries are moved in tanks they can, as noted, be flumed out with water, and only two men are required for the operation. Further, the tanks can be discharged at the rate of approximately 25,000 lb. per hour —or 12,500 lb. per man-hour.

It is estimated that a single tank truck, such as we used, having a capacity of some 20,000 lb. of cherries, would replace approximately 1,500 lugs. At present prices, 1,500 lugs cost the processor about $750. Tanking for this capacity, however, can be had for considerably less than $750, and repair costs on metal tanks run less than on wood lugs.

The above article is based on work carried out jointly by the Division of Mechanical Processing, Bureau of Plant Industry, Soils and Agricultural Engineering, USDA; the Agricultural Engineering and Horticulture Departments, Michigan State College, East Lansing; and the Michigan Fruit Canners, Inc., Benton Harbor, Fenneville, and South Haven, Mich. A comprehensive report on this work is being prepared, and it probably will be published by the Michigan Agricultural Experiment Station at an early date.

End (Resume reading on page 60)

New Twist

—*Continued from page 54*

be likened to the vertical projection of the path of a simple pendulum on a rotating cylinder.

In this case, the point of pendulum suspension is fixed with respect to the axis of the cylinder and located directly above its mid-point. Depending on the speed ratio between pendulum swing and cylinder rotation, the curve representing the projected movement ap-

Also manufacturers of Sno-Tex, Golden-Tex, Ny-Tex Neoprene, Kotton-Top Neoprene, Tred-Tex. Send for particulars.

SANI-CLEATS

Completely Sanitary for Conveying Fish, Meats, Baked Goods and Other Perishable Foods

Promotes sanitation because Sani-Cleats are vulcanized into the body of the belt. Cannot pull out and will flex around pulleys. Solves cleated belt problems and saves floor space. No bolts, rivets or metal. Replaces bucket elevators and stainless steel belts. Sani-Cleat Belt illustrated is being used for conveying chopped meat. Send operating data and let us make recommendation.

Quick delivery from our modern plant.

A. J. SPARKS & CO.
862-864 Grandville Ave.
Grand Rapids, Mich.

HAULTAIN COMPANY
320 East 8th St.
Oakland, Calif.

DeSHIPP BELTING CO.
1507 Franklin St.
Waco, Tex.

SPARKS BELTING

This emblem appears on all Sparks Belting. Formerly Champion.

Why it pays to specify BARRETT® BRAND ANHYDROUS AMMONIA

ECONOMY — It is the most economical and efficient type of refrigerant in use today.

PURE AND DRY — Barrett® Brand Anhydrous Ammonia is famous for consistent purity and uniform dryness. No other brand of anhydrous ammonia is purer or dryer.

FAST DELIVERY — Barrett Brand Anhydrous Ammonia is stocked coast-to-coast in 150, 100 and 50-pound cylinders. An adequate supply of cylinders in all sizes helps assure fast delivery in the size you want.

TROUBLE FREE USE — Every cylinder valve is carefully inspected before it leaves the plant. This assures you of properly working valves and trouble-free use when cylinders reach you.

FREE TECHNICAL HELP — Technicians specially trained in the use of Anhydrous Ammonia cylinders stand ready to help you at all times without cost or obligation. Write for free booklet, "Guide for the Use of Barrett® Brand Anhydrous Ammonia in Cylinders."

For greater savings, better service and better performance, specify Barrett® Anhydrous Ammonia—the brand with the bright green cylinder caps.

NITROGEN DIVISION ALLIED CHEMICAL

Nitrogen Division

ALLIED CHEMICAL & DYE CORPORATION

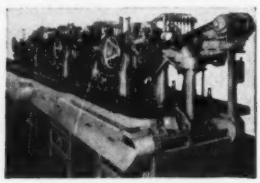
40 Rector Street, New York 6, N. Y.

FIRST IN AMMONIA SINCE 1890

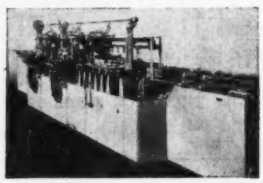
ONE OF THESE 4 WORLD LABELERS IS

the best Labeler in the World for you

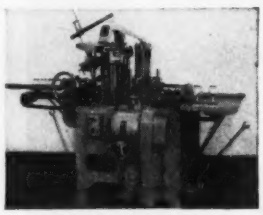
Which one, in your case, depends on: your production needs, your label types and sizes, your glass container shapes and sizes. Once we have the story we are in the world's best position to recommend the best Labeler in the WORLD.



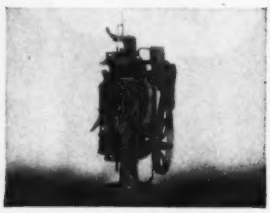
WORLD TANDEM available in one to six or more units—75 to 350 or more containers per minute continuous bottling line operation is assured.



WORLD BEE-LINE for precision application of body labels, front and back, neck labels, shoulder labels to many shapes and sizes of containers.



WORLD TURRET does quality labeling and is particularly qualified on difficult applications, no other labeler can do satisfactorily or economically.



WORLD MODEL "S" Semi-Automatic handles a great variety of container and label shapes and sizes. Easily operated with unskilled help.

WORLD LABELERS

SEE THE WORLD at Booth Number D-29
Canners' Exhibition — Atlantic City

ECONOMIC MACHINERY COMPANY
54 FREMONT STREET, WORCESTER 3, MASSACHUSETTS
Division of GEO. J. MEYER MANUFACTURING COMPANY
CUDAHY, WISCONSIN, U. S. A.

pears to be a helix with an ever-changing lead—or a zig-zag line whose amplitude is at the ends of the cylinder. Or, of course, it may be any curve which can be defined between these two extremes.

Experimental Runs

Processing results in the experimental retort were evaluated in terms of its efficiency in killing heat-resistant spores of food spoilage bacteria. All studies were conducted on No. 2 cans, although the unit could handle sizes from 6 oz. to No. 10.

It was apparent that the addition of rotation to end-over-end agitation resulted in an improved lethal action for a given process. However, when testing various combinations of speeds it was also apparent that there undoubtedly were practical limits to "Multi-Action," much as in straight end-over-end. For example, a treatment at 128-32 (128 rpm. rotating; 32 rpm. end-over-end) proved to be less effective than an 84-18.5 process, under the conditions evaluated.

To gain a picture of headspace movement, a ping pong ball was placed in a plastic container and subjected to "Multi-Action." Some of the rotation combinations studied were actually observed to impose two passes of the ball directly through the geometric center of the container in its bi-directional movement.

In Plant Use?

The new process was found to be particularly effective in killing spores. This would indicate that a higher temperature per given time unit is attained through a generally speeded heat transfer.

To evaluate effect of the new process on quality, some fresh tomato juice was run and its color depression measured with a Hunter Meter. It was determined that a 2.5-min. cook at 254 deg. F., 84-18.5 rpm. was as effective in holding color as a 3.1-min., 34-rpm. end-over-end process, or a 35-min. still-cook at 240 deg. F.

By replacing the frame of the yoke in the retort with a basket of the same diameter, it would be possible to increase the capacity of the "Multi-Action" cooker. With this basket, approximately 60 No. 2 cans could be treated at one time.

Greater capacity, of course, could be easily produced by increasing the size of the apparatus. And it is anticipated that most canners could make such a unit from existing equipment at fairly reasonable cost.

End *(Resume reading on page 55)*

Quality Control Reigns

—Continued from page 71

of shipping penalties can be obviated by a resultant more exacting carton weight control.

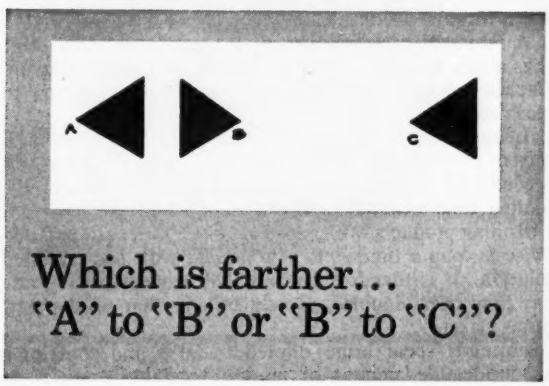
Using statistical analysis to assure minimum weight standards has another advantage. If it can be demonstrated that the product is holding consistently at a certain distance above its minimum weight declaration for a year or more, this can lead to a posting of a new higher weight value on its label.

In addition, since SQC has rapidly become an authentic substitute for continuous inspection—often condensing about 80 pages of data on one sheet—it provides a quick, valid reference in any disputed case involving a container or two which may be out of tolerances.

Statistical methods have also been recently applied in controlling the weight, headspace, water adsorption, and sieve test of the company's line of dry cereal products.

In fact, the chief of Inspection Service enthusiastically looks to the day when practically all variables in the manufacture of the product are held in line by similar techniques.

(Turn page)



Which is farther...
"A" to "B" or "B" to "C"?

Things don't always turn out to be *the way they appear.* Realizing this, leading food processors *test* with COOK-CHEX quality control tags.

And unless the purple spot on the tag has changed to green, they *know* that bacteria aren't completely destroyed. Write today for a free supply of COOK-CHEX, stating the time and temperature of your processes.

See for yourself how COOK-CHEX save time, save money, and insure your good name with consumers by eliminating the possibility of flat sours and blown cans.

Remember, things don't always turn out to be *the way they appear!*

ATI COOK·CHEX

Aseptic Thermo Indicator Co., Dept. FE5
5000 West Jefferson Blvd., Los Angeles 16, Calif.

SELLERS
HYDRAULIC JET CLEANER

LEAST EXPENSIVE TO BUY & OPERATE
MOST EFFECTIVE FOR HEAVY DUTY CLEAN-UP

Operated by ordinary plant steam and cold water lines, this unit propels a solid jet of extremely high pressured hot water and detergent.

at booth D-6

SELLERS Injector CORPORATION
1800 Hamilton Street Philadelphia 30, Pa.

PROVED IN OVER
1700 INSTALLATIONS!

Production soars with "JET" handling of condensate with a

cochrane C-B
CONDENSATE DRAINAGE SYSTEM

Over 1700 installations in every kind of steam process work, prove that the Cochrane "JET" principle of condensate drainage steps up production, cuts fuel costs and improves quality.

Up to 35% increase in production has been achieved. The Cochrane "JET" unit removes "insulating" layers of condensate from all types of steam processing equipment continuously and effectively. It produces faster, more efficient heat transfer; eliminates cold starts; speeds cooking, drying and curing cycles.

Improved product quality. The Cochrane "JET" unit levels out heat fluctuations—maintains uniform intense heat transfer, producing better quality product in less time.

Lower fuel and maintenance costs. The Cochrane C-B system chops fuel costs by 10% or more returning condensate to the boiler or "make-up" system without appreciable pressure or temperature drop—cuts make-up water requirements—eliminates flashing—reduces boiler room maintenance, automatically separates entrained air and corrosive gasses from returned condensate.

Write today for full information on how a Cochrane C-B High Pressure Condensate Drainage Control System can help you when used with . . .

Platen Presses
Jacketed Kettles
Dry Cans
Expellers
Drying Rolls
Coil Dryers
Stills
Vulcanizers
Tube Dryers
Ironers
Dry Plates
Unit Heaters
Jacketed Mixers
Paper Machines
Tumblers
Coil Cookers
Drum Dryers
Spray Dryers
Presses
Digesters
Heating Systems

cochrane
corporation
3173 N. 17th Street, Philadelphia 32, Pa.

Even when product has passed muster through all facets of ingredient and in plant quality control, and has routed from the plant into meshes of distribution, it is still very much a concern of the "QC" group.

Fact is, that—due to the discoloration factor primarily—glass-packed baby foods will retain top quality under poor handling for not much more than 20 to 24 months.

About six years ago the company started sending "QC" men into the field to check on storage in leased and customer warehouses. These trips were made during the annual plant shut-down period and involved intensive inspection to check on age of product, its condition, and method of rotation in the warehouse.

Last year, the salesmen were brought into it. Traveling "QC" men alerted company sales personnel in every city or area and teamed up in visits to both warehouses and retail outlets to dramatize this need for stock turnover.

Enlisting the sales personnel has proved a bonanza—particularly at the retail level. They now make a routine of scanning the rear of store display shelves to move forward any remaining older product (each year's pack has an identifying tab on its cap). This has had a remarkable success in diminishing color complaints.

Also, this intimate contact with shelf distribution permits a "personalized" run-down of any complaint.

End (Resume reading on page 73)

Bulk Brining

—Continued from page 73

Fed in within 3 ft. of the tank bottom, both make-up water and dilute brine—each of less specific gravity and hence lighter than the concentrated solution at the bottom—rise and carry up any trash or impurities. Thus, the salt bed serves as a filter, for the solution subsequently moves down through the bed.

A saturated brine solution is assured, since the solvent thus makes two passes through the salt bed during make-up. Capacity of tank provides ample time for the solution to reach saturation—100%.

In the former method of preparing brine in mechanical mixers from bagged refined salt, the solution seldom exceeded 85% of saturation. This was partly because of the limited time element involved.

Brining products with a solution of this strength required twice as long a time as it now needed with the saturated solution. It is therefore obvious that brine-processing rate has thus been doubled, merely by adoption of the new brine maker.

Formerly spent brine—diluted to 50% and containing a considerable amount of minute vegetable particles in suspension—was discarded as waste.

Now, brine drawn from the bottom of the salting tanks is returned to the brine make-up station. Here, in three separate wooden mixing tanks, a filter-aid is added before pumping weak brine through a wooden plate-and-frame filter-press for removal of organic material.

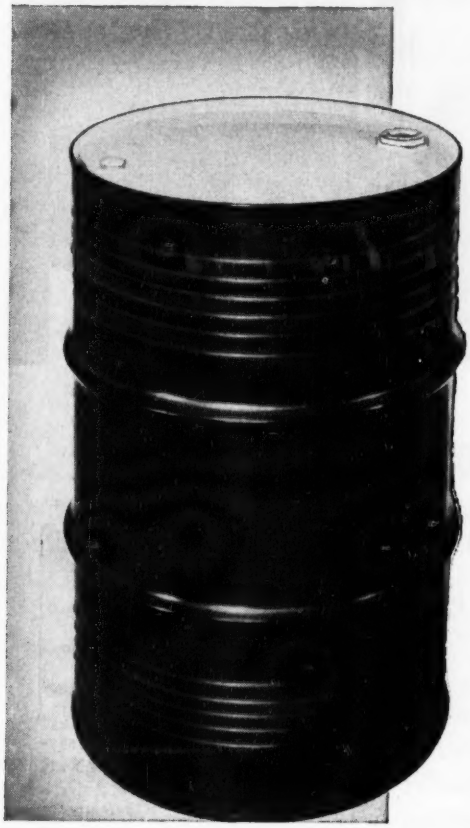
Clear filtrate is then pumped into the make-up tank for concentration and recirculation.

The new system specifically ups product quality, not only because brine pumped to process is fully saturated but also because purity of the liquid is much higher due to the dual filterings.

Also, simplification of handling and warehousing cuts labor and saves space. Tedious work of unloading 100-lb. bags and transporting them to storage is "out." Also the old carting of salt to the brine mixers. And of course there no longer are any bags to dispose. Warehouse space formerly given to salt now serves other uses.

End (Resume reading on page 74)

Here's how and why U.S. Steel drums now provide greater product protection



●U. S. Steel Products has recently developed a cleaning and finishing process that eliminates a source of customer claims . . . product contamination. Through this new process, drums are now available which are free of all dirt, grease, scale and other residues which can contaminate your drummed product. In addition, the drums are fully inhibited against rust and corrosion which can also contaminate the drummed product and mar the exterior surface.

An important feature of the new U. S. Steel drum is that the rust-inhibiting phosphate coating is applied on an absolutely clean, scale-free surface . . . after the head, shell and bottom have been formed. This means a better drum for you because the phosphate coating completely covers all surfaces of the drum including the welded side seam . . . will not flake off when banged around . . . will effectively retard rust and corrosion on both the interior and exterior surfaces.

The thoroughly-cleaned, rust-inhibiting surface of the U. S. Steel drum permits the safe use of a wide variety of decorative finishes. Bright, contrasting colors may be used showing your name and trademark or slogan. The finish will last much longer because the phosphate coating and spray-painted surface insure longer life.

For the protection of the products you package and for longer lasting drums, be sure to get steel drums protected by the U. S. Steel process the next time you order.

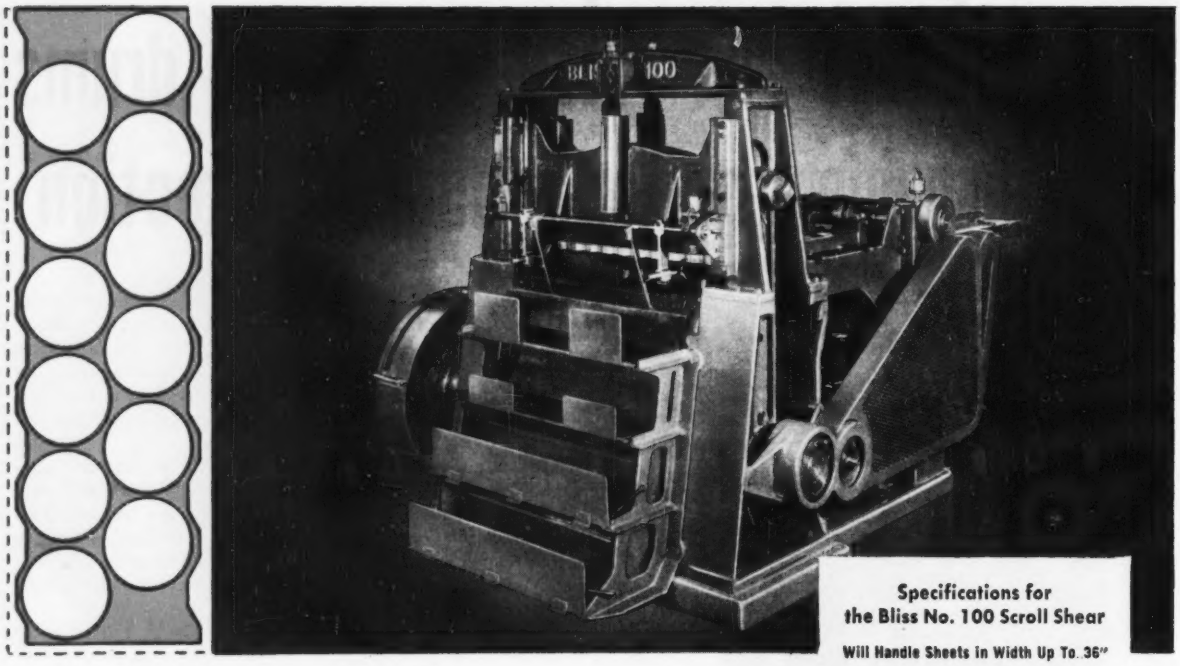
UNITED STATES STEEL PRODUCTS fabricates Stainless, Galvanized, Tinned, Painted and Decorated drums and pails. Furnished in capacities from 2½ to 110 gallons, with a variety of fittings and openings to fit your particular requirements.

"It's Better to Ship in Steel"

UNITED STATES STEEL PRODUCTS
DIVISION
UNITED STATES STEEL CORPORATION
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.
Los Angeles and Alameda, Calif. • Port Arthur, Texas • Chicago, Ill. • New Orleans, La. • Sharon, Pa.

USS

UNITED STATES STEEL



Specifications for the Bliss No. 100 Scroll Shear

Will Handle Sheets in Width Up To	36"
Speed—Strokes Per Minute	100 to 120
Net Weight, Lbs.	7500
Motor	3. H.P.
Height From Floor	37¼"

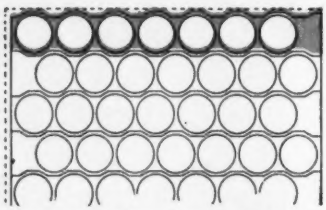
How to save 7% on scrap with the BLISS AUTOMATIC SCROLL SHEAR

Yes, by using the Bliss Automatic Scroll Shear, many leading can plants save up to 7% on scrap—and the illustrations on the right explain how it's done.

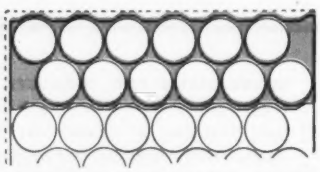
But this is only one of the features of the Bliss Shear. Look at these: the rigid body structure and heavy sliding members assure longer die life; the sheets are automatically and precisely located—insuring perfect registration; all operating mechanisms are *below* the table—lubricants never drip on and soil sheets; the shear can be arranged for plain or litho sheets, for automatic or hand feed.

If you're searching for low-cost, thoroughly-reliable can production, it will pay you to check the entire Bliss line . . . Write, wire or phone for complete details.

E.W. BLISS COMPANY, 50 Church St., New York 7, N. Y.



SINGLE ROW SCROLL STRIP offers savings over single strip method. In No. 1 can size, it saves 6.2%; in No. 2 size—4.6%; No. 3 size—1.3%. Two strips are blanked each stroke except the last.



DOUBLE ROW SCROLL STRIP—planned for double-die set-ups—gives even greater savings than above; can be used with Bliss Scroll Shears.

BLISS on your machine is more than a name . . . *it's a guarantee*

BLISS CAN AND CONTAINER MAKING MACHINERY

No Room for Industrial Complacency

Do you believe that American industry is equipped with remarkably up-to-date and efficient machinery? If you do, you are mistaken. The fact is that a large share of American industry's equipment is ancient, of obsolete design and incapable of attaining the efficiency that is made possible by modern production techniques.

This fact is documented by the Seventh Inventory of Metalworking Equipment, just completed by AMERICAN MACHINIST, a McGraw-Hill publication. In brief, AMERICAN MACHINIST shows that:

1. More than half (56%) of American industry's most basic production equipment—machine tools and metal-forming units—is overage, and much of it is so old that it has very limited usefulness.

2. Since Korea, the situation has become dangerously worse.

Facts vs. Plausible Theory

These conclusions contradict the widely-held impression that America's industrial equipment is in better physical shape than ever before. The prevalence of this impression is not surprising. We, as a nation, have spent about $125 billion for new industrial plant and equipment since World War II. That is more than in any previous period in our history. During 1953, American industry invested $21 billion in new plant and equipment, an all-time high. From this, it would be reasonable to infer that our industrial plant and equipment must be in fine condition.

But the facts do not support that inference with respect to the machine tools and other metalworking equipment that are so crucial to our economy in war and peace. Here are the key findings of the AMERICAN MACHINIST Inventory:

(1) More than one million machine tools—out of a total of less than two million in the metalworking industries—are at least ten years old. Many of these, after day and night operation

during the war years and the recent rush to rearm, are actually much older production-wise than their age in years indicates. In most cases, these machines are unable to produce goods as efficiently as modern equipment can, thus needlessly increasing costs.

(2) Almost one out of five machine tools is more than twenty years old. Most of these machines are so outdated by modern standards that they have little more than scrap value. And an even larger portion of our metal-forming equipment (presses, brakes and shears, bending and straightening machines) has passed the 20-year mark and is beyond normal retirement age.

(3) Two out of three machine tools are of designs predating World War II, though many of them have been built since the war. Thus, two-thirds of our machine tools fail to incorporate the many major postwar improvements in design and operating methods.

(4) Never before has outmoded high-cost equipment been so widely diffused throughout American industry. In every one of fifteen major divisions of metalworking production, more than 45% of the machine tools are at least ten years old.

(5) Not since the depression days of the 1930's has the average age of machine tools risen so rapidly as it has in the past four years. Today, 55% are ten years old or older, compared with 43% just before Korea.

Quality vs. Quantity

Why has the condition of our metalworking equipment been steadily deteriorating since the end of World War II? Part of the explanation lies in the fact that, in the immediate postwar years, production of metalworking equipment lagged behind the production of industrial equipment generally. The larger part of the explanation, however, lies in the tremendous postwar expansion of the American economy. This expansion, which has more than doubled our total industrial capacity, has imposed requirements for metalworking machinery that have been met only by more extensive use of old and obsolete tools. In the critically important field of metalworking, the job of providing up-to-date tools is bigger than it ever has been.

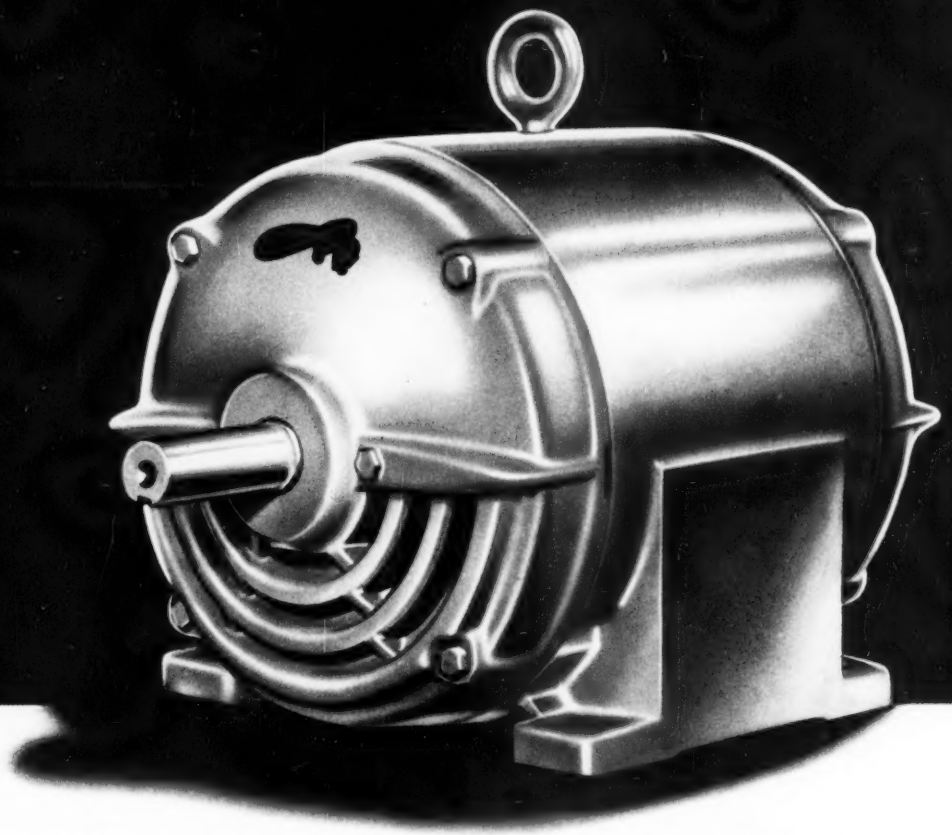
There are those who argue that the time has come to cut back investment in new industrial plant and equipment and divert more of the national income into current consumption. They cite both the great increase in the nation's total industrial capacity since World War II and the fact that some industries now have more than ample producing capacity to meet their needs. But this type of calculation leaves out the *efficiency* of that producing capacity.

The AMERICAN MACHINIST Inventory makes it manifest that in the key field of metalworking we are alarmingly short of first-rate, low-cost producing capacity. If we fail to remedy this situation by speeding the replacement of obsolete tools, it will be at the peril of our prosperity, at the peril of a sustained increase in our standard of living and of our national security.

McGraw-Hill Publishing Company, Inc.

Not just a "face-lifting" to meet the new NEMA standards,
but a completely redesigned motor line

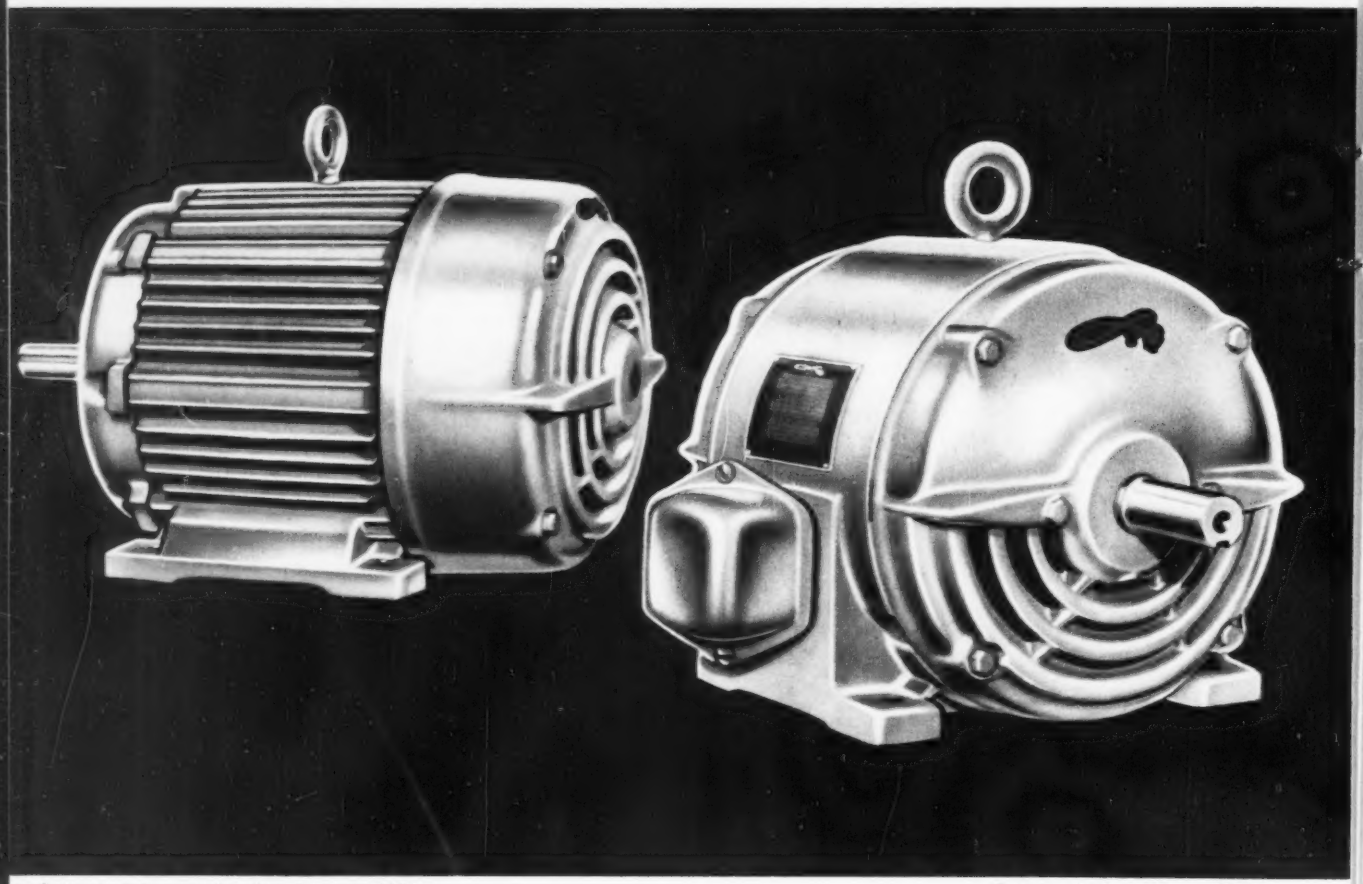
The Louis Allis Co. proudly presents the NEW L.A. *Line of electric motors*



. . . the concentrated utilization of over 50 years of engineering and development brings you this new concept in motors.

Please turn the page . . .

Here's new power for all standard and special motor applications



▲ New L. A. Fan-cooled and Explosion-proof Motor

▲ New L. A. Open Drip-proof Motor

From over 50 years of motor building experience and

many famous firsts including

the first fan-cooled, explosion-proof motor
the first rapid-reversing motor
the first really splash-proof motor
the first screenless textile motor

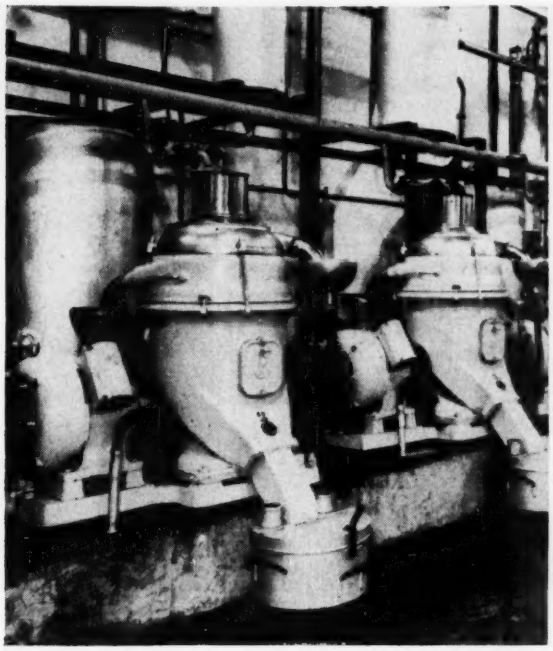
comes the NEW *Line*

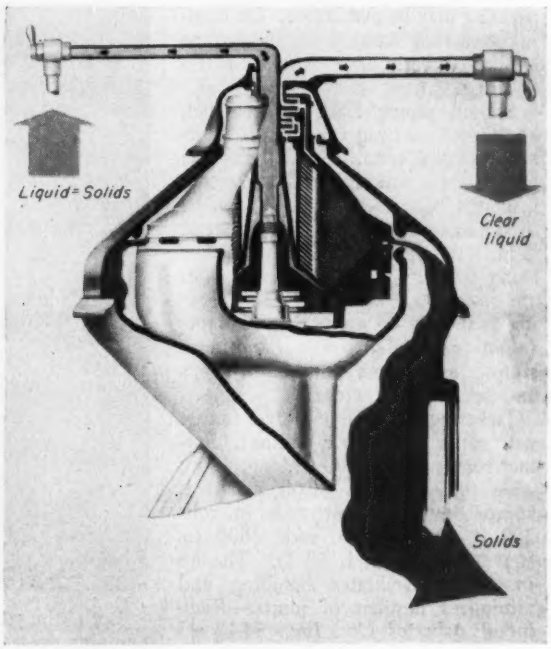
Here's the motor that's entirely new through and through, with such features as new modern styling... improved ventilation ...greater protection... new conduit box arrangement ...new bearing construction... and more versatile mounting. Get the facts on the most up-to-date motors available—the new L.A. line. See how these new motors can provide more power in a smaller package for your product or plant ...with the same high standards of Louis Allis performance, temperature ratings, service factors and torques. Call your Louis Allis Sales Engineer for the complete story.

Special Note *Louis Allis motors, built to the same high standards of quality and performance in the old NEMA standard frame sizes, will still be available if you require them for interchangeability or replacement.*

THE LOUIS ALLIS CO. • MILWAUKEE 7, WISCONSIN

NEW EQUIPMENT & SUPPLIES





Continuous Centrifugals Up Output, Simplify Work

Increased production, and simplified process work are claimed with use of these continuous, self-cleaning centrifugals.

Called Titan Superjectors, they can discharge solids, deposited within the bowl, while it is rotating at full speed. Thus, they are suitable for handling liquids containing relatively high percentages of insolubles. Units can be employed in breaking emulsions, clarifying liquids difficult to filter, separating water from oily liquids, removing sludge in concentrated form thereby hinimizing liquid-to-sludge losses, and treating liquids which must be handled quickly to avoid waste.

Special feature of units is that bowls can be opened at periphery to discharge accumulated sediments while rotating at full speed.

This operation is accomplished in an ingenious and simple manner. A telescopic displacement controlled and worked by hydrostatic pressure generated by centrifugal force does the trick. No mechanical connection between rotating bowl and stationary control means is used.

Bowls are supplied with disks for many purposes, and discharge operation can be made fully automatic if desired.

Sludge accumulated in bowl is discharged through peripherally placed slots which are uncovered by telescopic action actuated by a hydrostatic pressure built up by centrifugal force on water led into lower part of bowl. The bowl is kept closed by strong springs opposing effect of hydrostatic pressure.

Each discharge requires about two pints of fresh water. Operating water is ejected separately from bowl and will not contaminate component fluids.

Units are available in three models: N. S. 66, 70, and 150. Overall dimensions (height, width and length in in.), of units are as follows: N.S. 66—52, 25, 46; N.S. 70—58, 27½, 50½; N.S. 150—86, 41½, 71. Capacities in gph. are: 650, 1,650, and 3,330 respectively.—*Pitmar Centrifugal Machine Corp.*, 10 *E. Fayette St., Baltimore 2, Md.*

Circle 161A on Reader Service Card

New Aluminum Jacketing For Insulated Lines

Reduced maintenance, easier cleaning and improved plant appearance are advantages gained with use of Al-Cor-Jac, a sheet aluminum jacketing for insulated pipe lines.

Corrugated for strength, expansion and contraction, material is light, simple to install, and easy to handle. It is vapor, weather, vermin and fire proof. In cleaning operations, pipes covered with jacketing can be hosed down with rest of plant and equipment. From both a maintenance and sanitary standpoint, it is of particular value in high humidity areas.

When used over 85 percent magnesia, calcium silicate or where wet conditions exist, a vapor proof barrier is included. For this service, a kraft paper, impregnated and coated with an asphaltic compound is employed. This paper is bonded to the aluminum to facilitate handling and permits installation in one easy operation.

On new lines, yet to be insulated, conventional canvas covering and painting may be eliminated. On existing insulated lines, jacketing can be applied directly over present canvas covering.

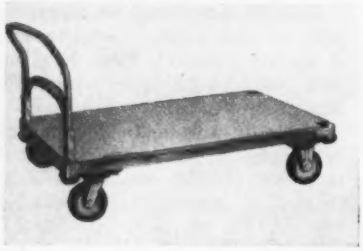
Should piping later be relocated, aluminum covering can be readily removed and re-used. Material can also be used on boilers, tanks and other insulated equipment.

When installing jacketing, a lap of 1 in. is made at each joint and also along seams. Installation accessories are optional. Any one of the following four may be used: Staples; tapes (aluminum foil); bands (aluminum straps); and screws (aluminum straps and self tapping screws).

Jacketing is available in two forms: with vapor barrier, and without. Former comes in rolls 100 ft. long, 48 in. wide (400 sq. ft.). Roll weight is approx. 40 lb. Latter is in rolls 200 ft. long, 48 in. wide (800 sq. ft.). Roll weight is 50 lb. The 48 in. width facilitates handling and minimizes number of joints.—*Richmond Asbestos Co., Inc., 54-18 43 St., Maspeth, L. I., N. Y.*

Circle 161B on Reader Service Card

All-Magnesium Truck Is Easy to Maintain



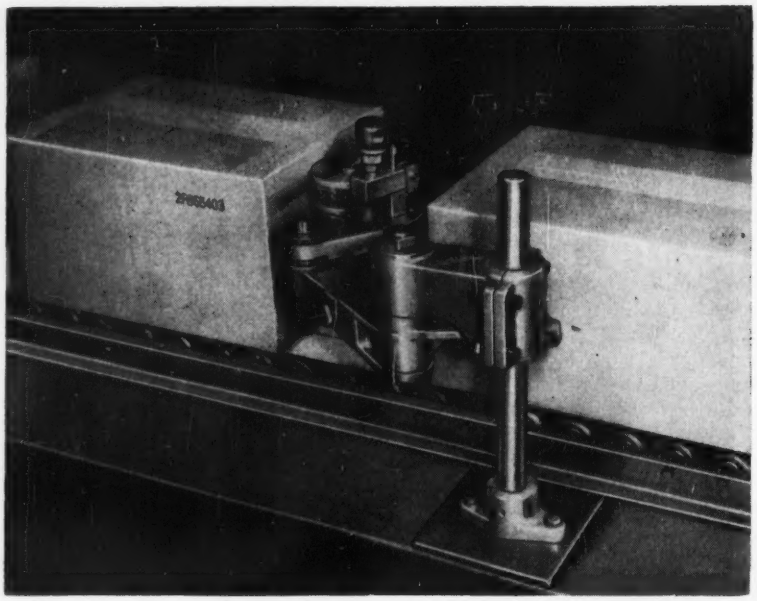
Lightweight and minimum maintenance costs are advantages claimed for a new, all-magnesium, 4-wheel platform truck for general materials handling use.

New truck is offered in ten different models. All trucks in series are capacity rated to handle loads up to 1,000 lb.

Improvements have been incorporated to provide user with greater serviceability and longer life. All parts are standard and replaceable. Handles are reversible and may be installed at either end of platform. Handles can be replaced with special racks or superstructures to make truck suitable for multi-purpose use.—*Magline, Inc., Pinconning, Mich.*

Circle 162A on Reader Service Card

Twin-Action Device Codes Cases on Two Sides



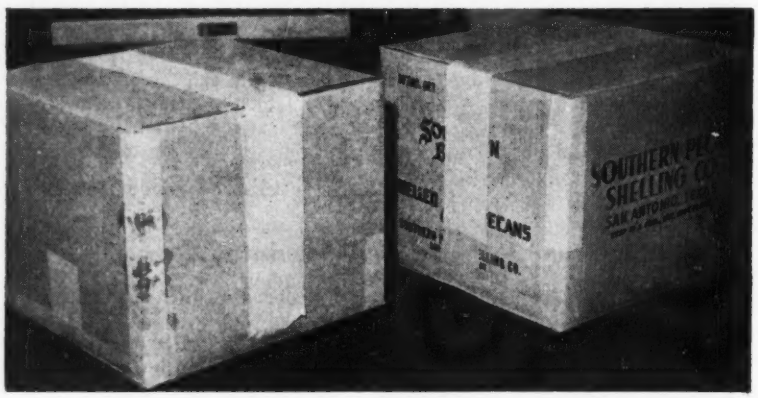
Both the rear and one side of shipping cases can be marked in code or lot numbers as part of the sealing and conveying operation with use of this new twin-action, friction-operated machine.

Unit, designated the Rolacoder "200", has been designed to work in tandem with a similar, front and side marking, model, the "500", to permit automatic marking of all four sides of cases without requiring cases to be turned. Multiple marks on cases facilitate identification regardless of how they are stacked or palletized. Where desired, two different identification marks may be imprinted on opposing panels of cases at same time.

Copy changes, it is said, can be made in a matter of minutes and machines's visible ink reservoir has a capacity for more than eight hours of continuous running. Mechanical operation of marking device is simple and free of complex parts.—*Adolph Gottscho, Inc., Hillside 5, N. J.*

Circle 162B on Reader Service Card

Corrugated Box Has Grease-Resistant Coating



Of interest to nut, potato chip and other food processors confronted with grease penetration problems is a new corrugated container.

New box has a grease-resisting coating designed to prevent oil from soaking through. It has been successfully tested as follows:

Shelled pecans supplied by Southern Pecan Shelling of San Antonio, Texas were used in laboratory tests which were continued for a six months pe-

riod in room temperature of 75 to 85 deg. F. and 30-65 deg. R.H. This temperature compares with normal commercial storage of 35 to 40 deg. F.

Two types of corrugated boxes were used: 1. Uncoated but lined with paper and employing a diagonal vertical pad: 2. Interior coated but without a pad.

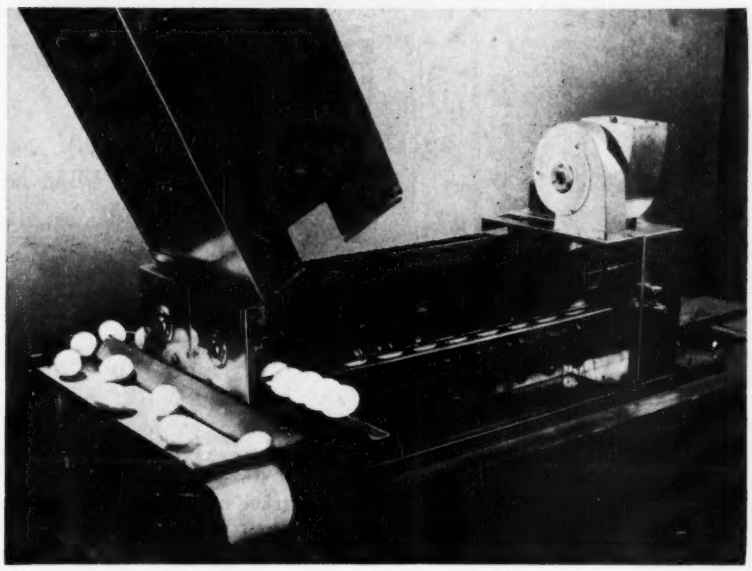
Result of six-months test was as follows:

Type 1 Box.—Before test was completed, oil has stained through to outer surface of this box (container at left in illustration). At end of test, pecan meats had a rancid odor and taste.

Type 2 Box.—No oil penetrated through this box (right in illustration). At end of test, meats had a good odor and tasted fresh and sweet. Coating used in latter shipping containers is known as No. 7. It is applied to the cylinder liner board at paper mill before laminating and corrugating is done.—*Gaylord Container Corp., 111 N. 4th St., St. Louis 2, Mo.*

Circle 162C on Reader Service Card

Automatic Unit Washes, Dries 1,500 Eggs Per Hr.



Savings in time and labor in washing eggs are reported with use of this new, fully automatic machine.

Available in two models, the larger unit washes and drives 1,500 eggs per hr. Smaller unit washes 750 per hr. but does not dry them. Machines are constructed of stainless steel and aluminum and operate on 110v. a.c. current.

Washers minimize water absorbed by eggs' porous shells providing an effective method for cleaning hatching eggs. Unit's gentle handling permits eggs with extra-thin shells to travel through without harm. Nylon fiber cylinder brushes developed by Fuller Brush engineers, scrub and dry without egg breakage. Brushes will clean from ½ to 1 million eggs before needing replacement.

Here's how the washer works: Eggs are conveyed beneath scrubbing brush on a spiral-ridged rubber roller. Rotation of roller in opposite direction from thin, open-lead brush, keeps egg balanced on top of roller, revolving and exposing all sides to brush's cleaning action.

A perforated tube running alongside roller sprays 185 F. water on eggs. As they reach end of rubber roller, eggs are transferred automatically to a second roller which carries them in the opposite direction.

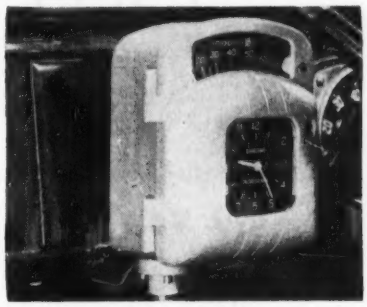
Above this roller is a revolving drying brush. Entire drying assembly is enclosed, with an exhaust fan at one end of the unit which creates a partial vacuum.

This vacuum along with action of brush, gently and rapidly dries egg surface.

Both models are compact and easily installed. — *Marzolf Manufacturing Co., Strykersville, N. Y.*

Circle 163A on Reader Service Card

New Model Tachograph Much Easier to Read



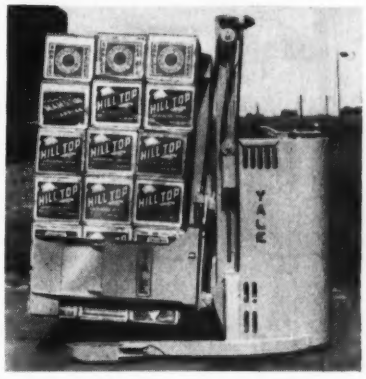
Easier setting of warning light, a more durable case and mechanism, and a more readable instrument face for the driver are improvements claimed for the new Model AA miles-per-hr. tachograph.

Instrument is used for analyzing vehicle operation and movement. It graphically records on a chart the miles traveled, speed traveled, idling of engine and the time the vehicle was in operation. Its charted information is valuable in reducing maintenance costs and encouraging safe driving practices.

Warning light is easily set by driver to conform with prevailing speed limits. Chart is easily inserted on rectangular stud. A million-mile odometer accurately records total mileage of vehicle. — *Wagner Electric Corp., 6400 Plymouth Ave., St. Louis 14.*

Circle 163B on Reader Service Card

Tilting Stabilizes Load On Rider-Type Truck



This new Warehouser electric rider-type straddle truck permits 4½ deg. backward tilting of loads without effecting unit load capacity.

As the load is raised on the truck, it is tilted automatically by cam on

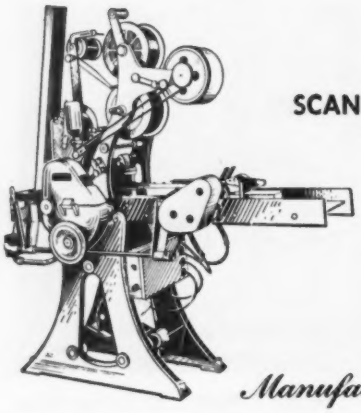
PRIZE PACKAGING

by **SCANDIA**
MACHINERY

BOOST SALES AND INFLUENCE BUYERS

In this era of Super-Market merchandising, makers of popular priced items such as candy, chewing gum, etc., are finding Scandia's multiple-pack automatic wrapping machines to be a tremendous SALES BOOSTER.

The Nestle Company, Inc., have successfully used Scandia high speed wrappers to present six of their famous chocolate bars wrapped as a single unit.



SCANDIA machines - - -

. . . costs less than you think
. . . all rotary—continuous design
. . . opening-tape, electric eye, etc.
adjustable for different sizes

SCANDIA

Manufacturers of Better Packaging Machinery

• 500 BELLEVILLE TURNPIKE • NORTH ARLINGTON, N. J. •

BUNDLING • BANDING • MULTIPLE WRAPPING • STAMPING • HIGH SPEED WRAPPING

MANUFACTURED UNDER BRONANDER PATENTS.

For more information, use coupon on page 209.

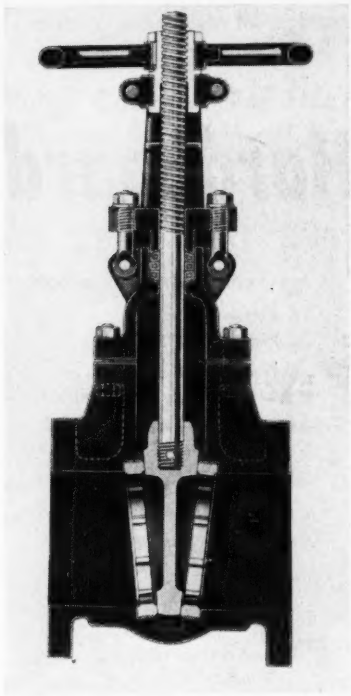
upright channels. A hinge at top of carriage permits the action. Backward tilting insures load stability and is particularly desirable with lightweight or awkwardly shaped loads or for use on rough floors.

Truck, specially designed for narrow aisle operation, can right-angle stack in aisles 6 ft. wide. Unit is termed well suited for older type buildings with limited floor load and elevator capacities.

Single lifting cylinder allows operator a clear view of fork and outrigger tips for close operations. Truck has a dead-man safety control treadle which instantly cuts off power and applies the brake when operator leaves it.—*The Yale and Towne Manufacturing Co., Roosevelt Blvd. and Haldeman Ave., Philadelphia.*

Circle 163C on Reader Service Card

New, Iron-Gate Valve For Mild Corrosives



This new, 125 lb., iron gate valve is designed for economic service on mildly corrosive installations in the process industries.

Cast iron body and bonnet of new valve contain 3 percent nickel, giving them an extra margin of corrosion-resistance over ordinary cast iron in many services. Trim, where corrosion usually does greatest damage, is made of most corrosion-resistant alloys used for valves. A choice of trim materials is offered—either 18-8 Mo. stainless steel or all-Monel.

Disk-guides in valve bodies are precision machined and hold disk in perfect alignment as valve is closed, preventing pressure from forcing disk against opposite seat. As a result, disk cannot "chatter" and cause excessive wear as valve is operated.—*The Lunkenheimer Co., Box 360, Cincinnati.*

Circle 165A on Reader Service Card

Fast Dumping Sweeper for Heavy Duty Cleaning

Over 100,000 sq. ft. per hr. in open areas can be swept by this newly developed power sweeper, states maker. Further, unit can be dumped by one man in about 30 sec.

Operated by one man, machine is said to do work of a 3 to 12-man pushbroom crew. It covers a 36-in. wide path; picks up dirt, litter and dust at speeds up to 6 mph. A rotary 21-in. side-brush increases path width to 48 in. and allows cleaning flush with walls, curbs, fences and under guard rails.

Special feature is fast mechanical dumping. With a few turns of a ratchet-type lever, one man tilts fully loaded dirt hopper and dumps loads weighing up to 700 lb. This operation takes about ½ min.

Sweeping is said to be practically dust-free. A high-speed brush, rotating inside a vacuumized compartment, hurls heavy debris and dirt in a 9 cu. ft. hopper. At same time, a high volume 11-in. fan draws lighter dirt and dust into a large fabric bag. Brush compartment is "sealed-to-floor" by a heavy, flexible rubber skirt so dust can't escape.

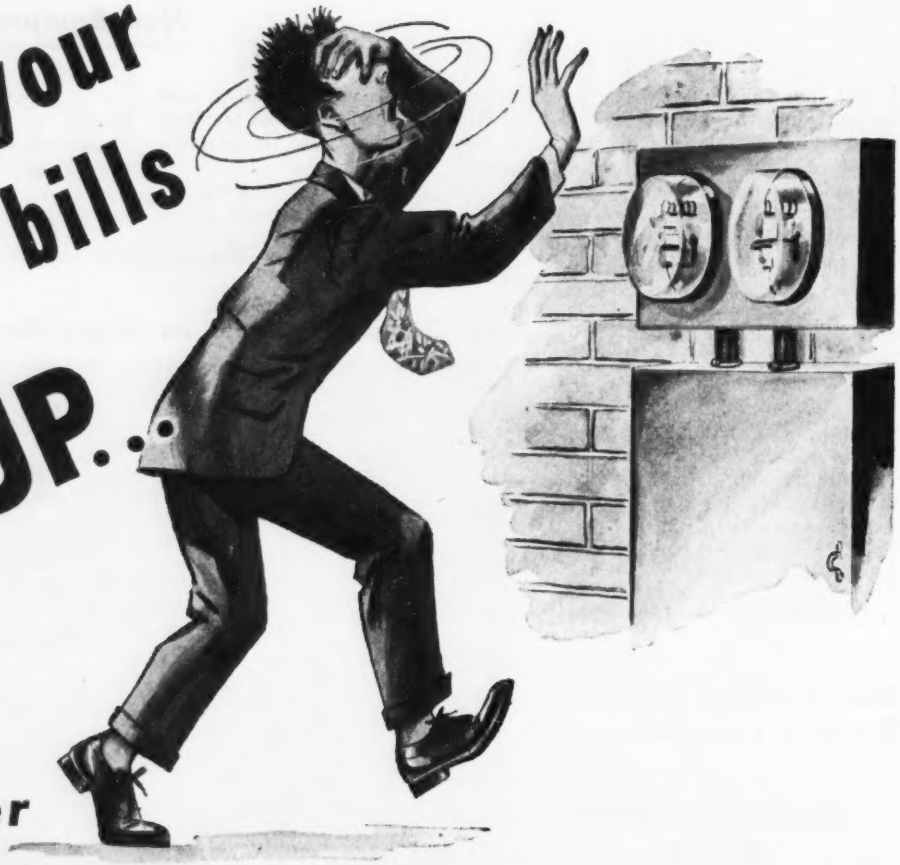
Sweeper is specially designed for easy handling in congested areas. Automotive-type steering (through rear wheels) permits turns in 5-ft. radius.

Frame is made of 1¼-in. tubular steel, welded and reinforced with steel gusset plates at stress points. High clearance at front of sweeper makes it easy to climb and descend ramps. Large 12-in. wheels provide smoother riding over rough floors, across tracks.

A 7.3 hp. air-cooled gasoline engine powers machine. Drive is through a ⅜-in. pitch drive chain and hardened alloy steel bevel gears. All moving parts are sealed and protected from grit and dust. Other standard features are an auto-type battery, built-in generator and pushbutton starter.—*G. H. Tennant Co., 2566 N. Second St., Minneapolis 11.*

Circle 165B on Reader Service Card

when your power bills GO UP...



Remember

RUBATEX *Insulation Hardboard*

*Makes More Cents**

Don't always blame the Power Company when your refrigeration operating costs begin to climb. First check the big savings advantages of Rubatex Insulation Hardboard. Its constant low heat conductivity assures positive temperature control and Rubatex installation requires as low as 53% as much power as other insulating materials to maintain low temperature. Real power savings? You bet it is!

PLUS

*CONDENSATION PREVENTION SAVINGS — Zero moisture pick-up prevents surface and internal condensation—resists deterioration — prevents damage to machinery and food.

*SANITATION CONTROL SAVINGS Rot, vermin and termite proof — cannot breed or feed anything objectionable.

*LABOR AND MATERIAL SAVINGS May be installed just as received from factory — no water vapor barrier need be applied.

TYPICAL INSTALLATIONS

Abbotts Dairies, Inc.
Philadelphia, Pa.

Fruehauf Trailer Co.
Chicago, Ill. — Detroit, Mich.

Geo. A. Hormel & Co.
Austin, Minn.

Grumman Aircraft Engineering Corp.
Bethpage, L. I., N. Y.

The Liquid Carbonic Corp.
Chicago, Ill.

Avco Manufacturing Corp.
Cincinnati, O.

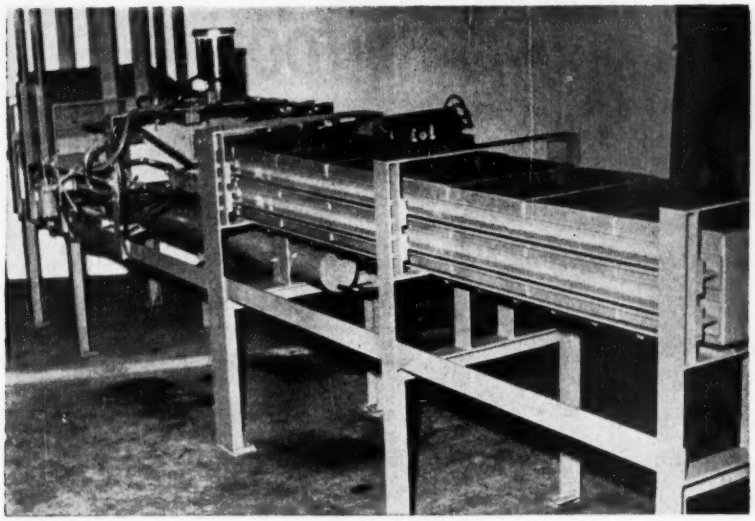
Food Fair Stores, Inc.
Philadelphia, Pa.

Write for our "Design Data Bulletin RBH-53", Dept. FE-1 Great American Industries, Inc., Rubatex Division, Bedford, Virginia.

PIONEER MANUFACTURER OF CLOSED CELLULAR RUBBER

RUBATEX CLOSED CELLULAR RUBBER

Unit Opens, Gathers, Packs, Seals Cases



In case packing operations, this compact machine is reported to do the work of four units—opener, accumulator, packer and sealer.

Named the "Quadnumatic", unit is designed to automatically open and form cases, accumulate the contents, insert into the case, fold and seal. Machine is custom built to handle either packages, cans one tier high, slabs of chocolate for packing into an end open style corrugated case.

In operation, cases are selected automatically from a stack at end of machine, carried forward, one at a time, and brought into opened and formed position adjacent to accumulator table. When required number of packages, cans, slabs, are accumulated automatically, machine will trip and plunger will inject load into opened case.

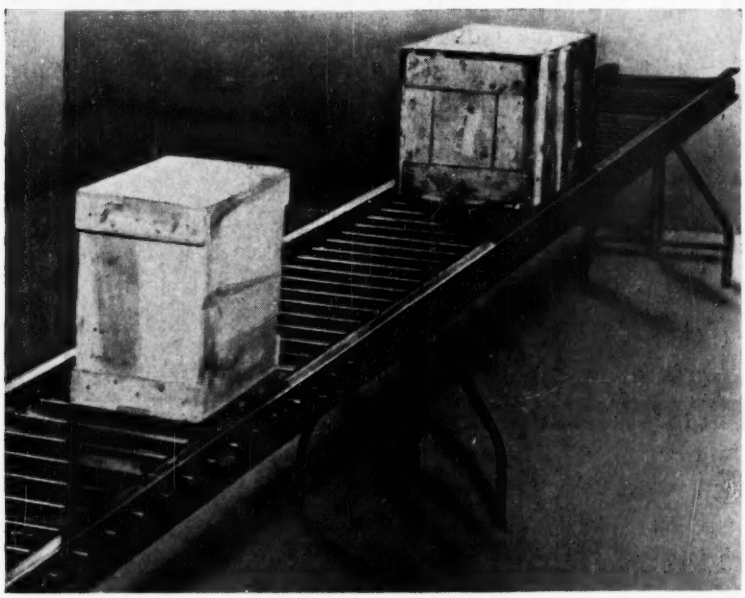
This action will start machine automatically, carrying filled case through glueing mechanism and folding arms into pressure sealing unit. Simultaneously another case is brought up into the opened and formed position, completing the cycle. There are no continuously moving parts. The machine is entirely pneumatically operated.

Machine is constructed of welded steel occupying a space 16 ft. long and approximately 30 in. wide, depending on width of case to be packed. Accumulator table, approximately 15 in. wide and 40 in. long, projects perpendicular to the longitudinal axis of the machine.

Unit is completely assembled, but shipped in three sections to facilitate handling. All piping is complete. Glue is applied through plastic applicators from an entirely enclosed system. Hydraulic pressure is built up in lines from an air actuated pump causing the effusion of glue from applicator itself, properly timed by forward motion of machine. System is reported clean, efficient, and requires a minimum of attention.—*Schroeder Machines Corp.*, 3122 *Grant Blvd., Syracuse 1, N. Y.*

Circle 167A on Reader Service Card

Roller Conveyor For Heavy Loads



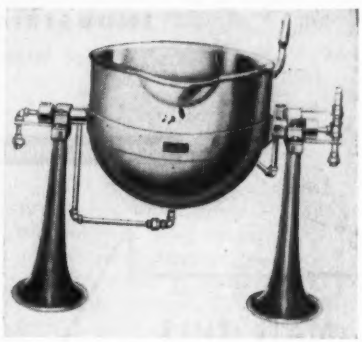
New line of 2¼ in. heavy-duty roller conveyors for use where capacity up to 600 lb. per roller is required, has been announced.

New conveyors meet wide range of heavy duty requirements and are available in standardized widths from 6 to 36 in. in 5 and 10 ft. and 90 deg. curves.

Rollers have 3/16 in. wall thickness and may be equipped with heavy duty standard bearings, grease packed, or dust sealed.—*Sage Equipment Co., 31 Essex St., Buffalo 13.*

Circle 167B on Reader Service Card

Sanitary Features Mark New Kettle



Improved sanitary features highlight the design of this new stainless steel, steam jacketed tilting kettle. Flanges, joints, cracks and crevices where food residue and bacteria can collect have been eliminated.

All joints are welded round and flush, and both interior and exterior

TO THE INGENIOUS

Not familiar with this

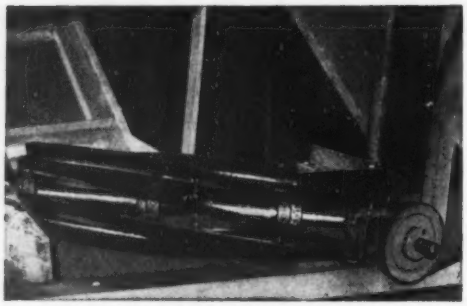
NEW INDUSTRIAL TOOL

Free Sample of Fullergript Brush Strip

What problems can you solve by adapting Fullergript to your equipment?

This brush strip can be bent, coiled, or twisted into numerous shapes. It can be formed to give intermittent or continuous brushing action. It can be attached to stationary or power driven mountings . . . can be adapted to your present machines or designed for new machine uses. Size possibilities are almost unlimited. To date they run from ¼ inch to 18½ feet in length. How it may help *you* is a matter of your own ingenuity — plus the services of the Fuller Brush Engineering Dept. Find out what Fullergript can do by sending for a sample strip. We will also send a booklet showing its versatility. Simply write us.

Open-spiralled Fullergript brush flicks water from cans after spray cooling—eliminating labor expense and improving the quality of the cans.



Fullergript power brush built to run constantly in water and transfer fish "gurry," which has plenty of acid, from a conveyor belt to an elevator.

INDUSTRIAL Fuller BRUSH CO. **DIVISION**

3640 MAIN STREET • HARTFORD 2, CONN.

Power driven brushes, Factory & Institutional cleaning tools, Waxes & Detergents

MAIL THIS COUPON TODAY

The Fuller Brush Co., Industrial Div.
3640 Main St., Hartford 2, Conn.

Please send me without cost or obligation a short strip of Fullergript — and tell me how it cuts costs when used as a machine component.

Name .....

Company ..... Title .....

Street .....

City ..... State .....

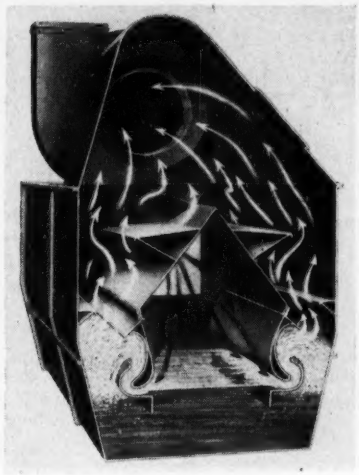
For more information, use coupon on page 209.

are high polished for quick and easy cleaning. Smooth, streamlined legs are vermin repellent.

Kettle, two-thirds steam jacketed, has extra large steam connections, a specially designed steam spreader to give faster heat-up, air release cock and positive locking tilting device. Style C kettles are available in capacities from 20 to 60 gal. with pressures to 125 psi.—*Hamilton Copper & Brass Works, Dept. 4, 820 State Ave., Cincinnati, Ohio.*

Circle 167C on Reader Service Card

Hydrostatic Precipitator Removes Dust From Air



Effective dust removal from the air is claimed for this Type N Roto-Clone collector, an improved hydrostatic precipitator. Dust is separated from the air by means of an S-shaped water curtain.

Units are available in three basic arrangements which are identical in operating principle but differ in hopper design and means of sludge removal.

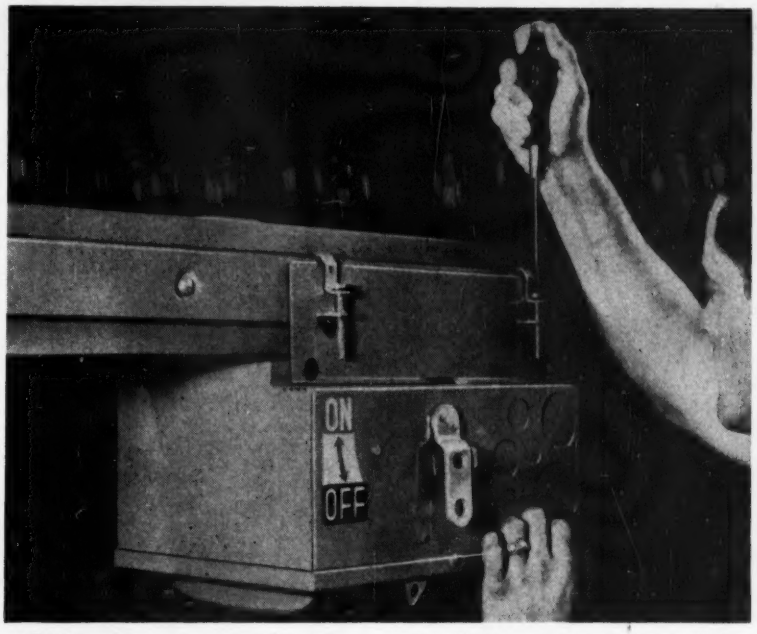
The three arrangements provide for manual cleanout and continuous drain and sludge ejection by flight conveyors.

Among improved features are: non-plugging water entrainment separators; heavier sludge ejector mechanism; wider range of sizes and capacities; and section construction to permit field conversion from one arrangement to another.

The units are now made in sizes for capacities ranging from 1,000 to 48,000 cfm.—*American Air Filter, Inc., Louisville 8, Ky.*

Circle 169A on Reader Service Card

Device Speeds Tapping of Power From Busway



Getting power from overhead busway to machines below has been made easier and faster by an improved device recently developed.

Working on same principle involved in plugging into a wall socket, new Flex-A-Plug taps power from heavy current-carrying busway for machines and other equipment.

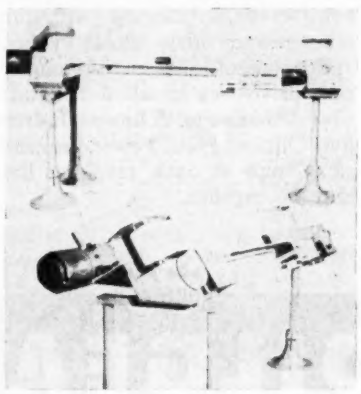
Installation is made easier and faster, according to maker by new hanger clips which hold plug in position while screws are tightened to anchor it firmly to housing. By actual test, it took an electrician 12 min. to install the old type plug, as opposed to three minutes for the new plug.

Electrically, new plug features same type of interior used in safety switches. This interior operates on circuit breaker principle of arc interruption. Use of grid pins, magnetic repulsion and other circuit breaker principles to interrupt arcs gives this interior a high momentary current rating, the ability to resist heavy current surges without damage.

Mechanically, plug is designed with heavy gage steel side shields which protect its stabs, the copper prongs which provide the contact with the bus bars. Stabs are further protected by a rugged phenolic shield which encases them. Phenolic shield also provides electrical insulation.—*Trumbull Electric Dept. of G. E. Co., Plainville, Conn.*

Circle 169B on Reader Service Card

V-Type Unit Offers Sloped Handling

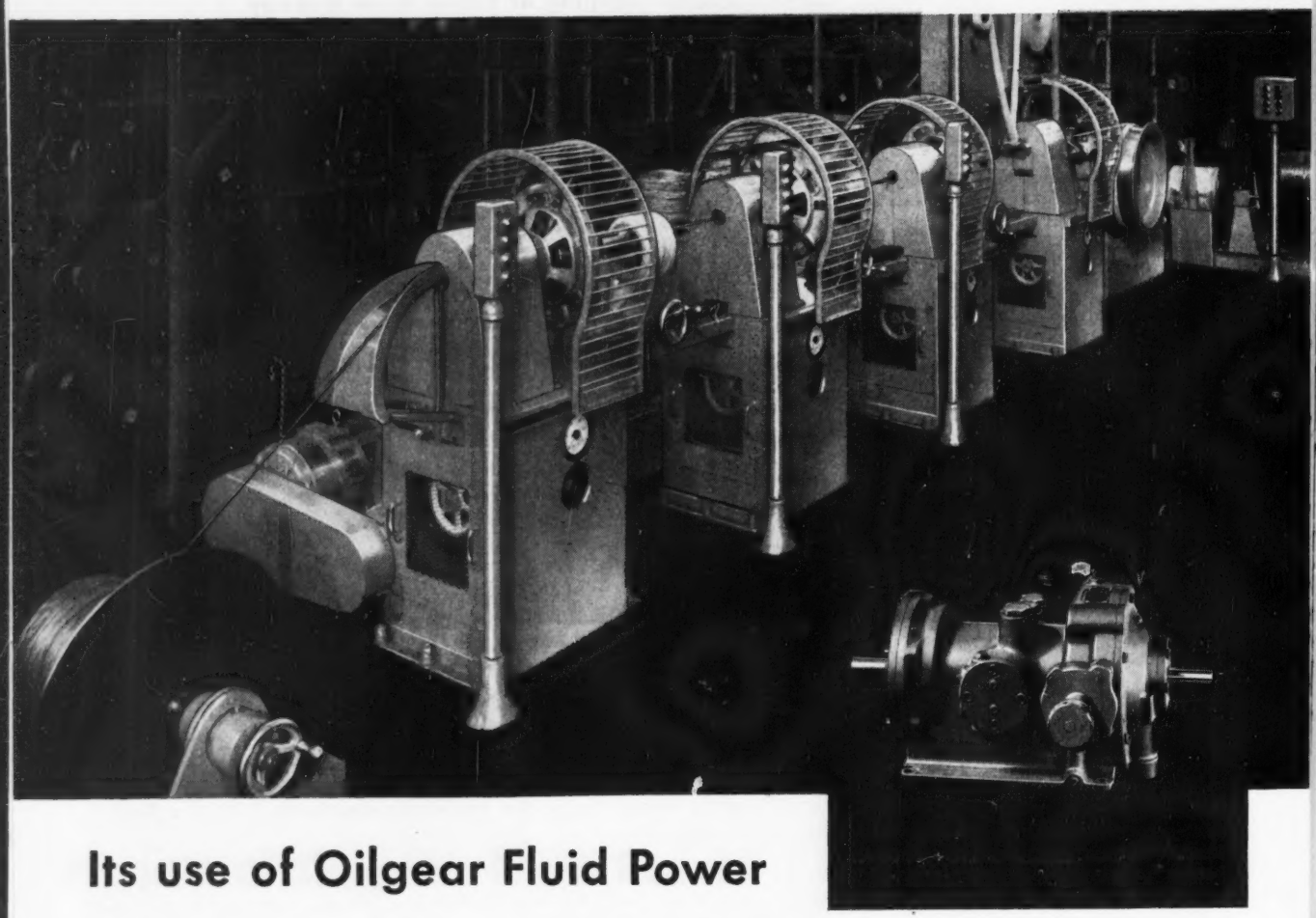


This new mover is designed for various operations where a V-type carrier would be more advantageous than a level or flat conveyor.

Constructed of formed 14 gage steel beds in two widths (5 or 8 in.) with 1 to 6 in. belts driven by a fixed speed motor and miter gears. Unit illustrated is set at 45 deg. with floor leg supports. Unit can also be suspended from ceiling or mounted above an existing conveyor. Available in 5 to 10 ft. bed lengths.—*Island Equipment Corp., 27-01 Bridge Plaza North, Long Island City 1, N. Y.*

Circle 169C on Reader Service Card

MACHINE DESIGN AT WESTERN ELECTRIC



Its use of Oilgear Fluid Power

Western Electric Company, manufacturing unit of the Bell Telephone System, originates, designs and builds many of the special machines it uses in its own manufacturing processes. It also maintains unceasing pressure to improve upon machines already in operation, for optimum performance, for better product, for lower costs, for freedom from trouble.

Its use of Oilgear Fluid Power Drives and Transmissions has been increasing because, in the words of their engineers, Oilgear enables them among other things to synchronize many machine components easily and economically. A good example of all these points is the "short haul" video cable wrapping machine pictured above.

This machine was designed and built by the company's own men some years ago. For optimum performance, the speed of the heads should be easily and independently variable and the direction of rotation instantly changeable because the lay and pitch of the wrappings must be varied according to the requirements of the run. Moreover, the inside contour of the tube formed by the wrapping should be smooth and uniform so as to avoid setting up echo waves that interfere with transmission and vitiate signal strength.

Because of these requirements, a new drive was installed something over 4 years ago. A line shaft drives five Oilgear Fluid Power Transmissions, one at each machine head and the capstan.

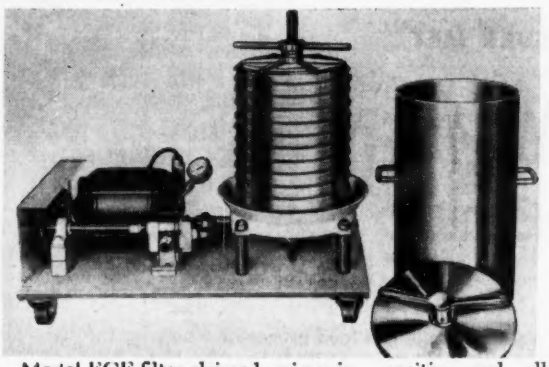
The results were these: uniformity and control of tension are so good, the machine runs at 4 times its former machine speed; it is easy to vary speed and direction of rotation of each individual head; eccentric heads gave way to concentric heads, and supply spools are now loaded to full capacity instead of ¼th to ⅛th as before; the machine is stopped less frequently for loading. Maintenance on the former drive was involved and frequent—on the Oilgear equipment it has been simple and negligible.

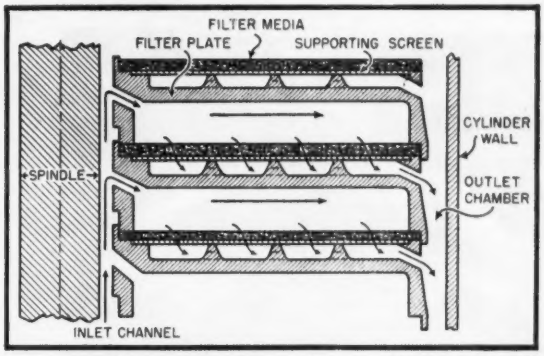
There is some reason to suspect that Oilgear Fluid Power with its wide range of advantages may solve some of *your* machine design problems and make the results very pleasing and profitable. Why don't you really find out? THE OILGEAR COMPANY, 1580 West Pierce Street, Milwaukee 4, Wisconsin.

OILGEAR

OILGEAR

Down Flow Filter Is Fed From Center, Has Uniform Cakes





Model ECF filter claimed unique in design, is a center feed unit, featuring down flow filtration principle. This provides a means for building a uniform, stable cake which will not part from screens.

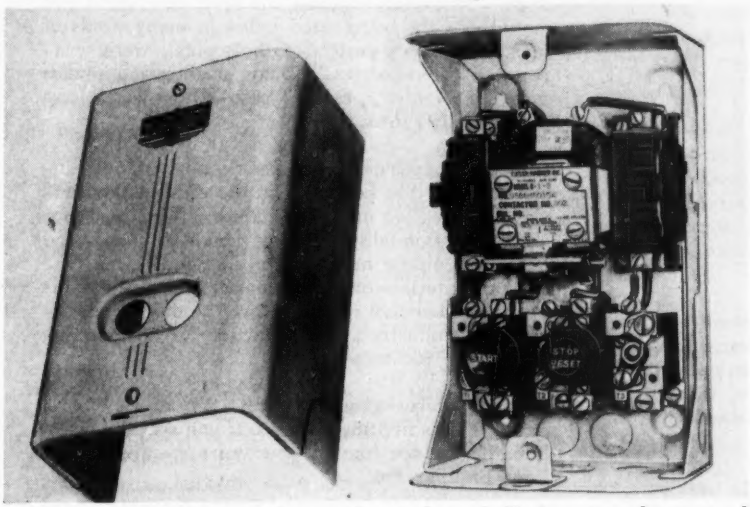
Amount of unfiltered material in unit is kept to a minimum, being only that contained in center feed pipe rather than within entire cylinder. Unit is arranged so that filtering elements are tightened independently from outer cylinder. This provides a positive seal, allows use of various types of filter media, and prevents danger of bypassing unfiltered liquids. Materials are not lost due to leakage or evaporation.

In typical filtration cycle liquid enters through inlet pipe in center of plates (see illustration right) from which it is forced over filtering area and through media. Filtered liquid passes into chamber between filtering unit and outer cylinder and leaves via outlet pipe located on side of filter base. Unit is quickly and easily cleaned.

Capacity is 2 to 20 filter sheets. For installations where unit is to be used for various types of solutions, plate capacity can be varied by use of spacer collars. Pump or motor are optional equipment depending upon requirements. Model is normally made in stainless steel, but can be had with nickel plated bronze circulatory system if desired—*Erterl Engineering Co., Clinton Ave., Kingston, N. Y.*

Circle 171A on Reader Service Card

Unit Construction Marks New Magnetic Starters



Ease of installation and improved performance are reported for a new line of magnetic starters, contractors and relays.

New line incorporates a simple, five-unit construction. A wrap-around cover pulls off, fully exposing front and both sides of unit for 180 deg. accessibility. Five independent parts consist of two contact blocks, a magnet coil, an armature, and a 3-coil or 2-coil overload relay mounted on a steel panel. Each part can be removed individually from front.

Line features 3-coil, adjustable overload relay permitting 4 ratings from each heater coil by changing its position. This adjustability provides protection within 3 percent of full load motor rating. The 3-coil overload is stated to offer better protection against single phasing where unbalanced or unstable load conditions may occur.

Double-break contacts, made of special silver alloy, can be inspected by pulling off a snap-on cover; contacts can be removed without tools. Complete contact block can be removed by loosening two screws; overload relay by simply turning out two screws.

Armature, pivoting on roll bearings, and magnet coil may be replaced easily without tools. Complete panel, with all units assembled, can be taken out of metal case by loosening three screws.

All terminals are angled to face front, and are equipped with solderless connectors.

Cover and base are finished in grey enamel baked on bonderized metal.—*Cutler-Hammer, Inc., 312 N. 12th St., Milwaukee 1.*

Circle 171B on Reader Service Card

Want More Information?

It's free—and easy to get. Simply note here the items on which you want more details, then circle each key number (there's one given at the bottom of each item) on the handy Reader Service postcard—page 209. Then sign at the bottom and mail.

For your convenience, too, items in this department are listed and keyed in the Reader Service Section.

CONTINUOUS HEAT-EXCHANGER

THE TIDAL WAVE AND **YOU:**
CONTINUOUS HEAT-EXCHANGER IS TYPICAL

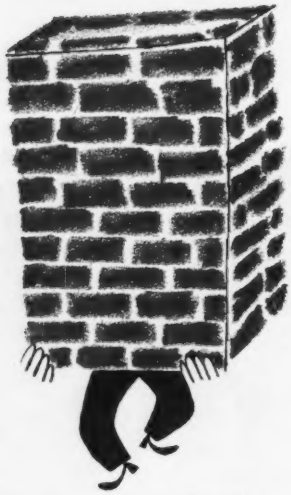
ONE OF the most dramatic examples of the danger of "industrial isolationism" (ignoring new developments outside your own *kind* of plant) is the rise of continuous heat-exchange in food plants.

Thousands of food plants would be paying unnecessary production costs today, for instance, if they had not "borrowed" the *continuous rotary-scraper heat-exchanger* from food processes supposedly "unlike" their own. The graph above shows how this happened.

This piece of equipment began its career as an ice-cream freezer in about 1928. But, even then, it seemed to have all the merits of an ideal convection-conduction heat-exchanger. Sure enough, in the early 30's, it began its steady movement from one kind of food plant to another – to edible-oil plants and meat plants for shortening and lard, to orange juice plants, to margarine plants.

By the mid-40's this apparatus was riding the *tidal wave of engineering*. Processors of peanut butter, cake batter, juices, purees, pulps, salad dressings, had taken it up. Dairy plants began using it for plastic cream, condensed milk, cheese, chocolate milk. On it went into corn canneries, candy plants, baby-food plants. It hasn't stopped yet!

Readers of FOOD ENGINEERING knew about the *rotary-scraper heat-exchanger* long before competitors who were not FE subscribers. For FE reports on *all* food processes – helping each *kind* of food plant use the experience of the others.



EVER MET

Waldin Smugg?

Waldin Smugg is a food processor who goes through life inside a stone wall. It was built by Smugg's own narrow view of things. He feels that the food product *he* makes has nothing to do with other kinds of food plants. *He* doesn't care about engineering developments in bakery, brewery, cannery, dairy, meat plant – or *any* kind of food plant other than his own.

Waldin's case is tragic, whether he is an owner or a part of plant management. For, since 1946, *thousands of food companies have gone out of business.* Today, there are 8% fewer food plants than there were 7 years ago. Those that died *failed to compete* in an era of rising costs. They failed to keep up with a cost-cutting, quality-building tidal wave of *engineering* now sweeping the food industry.

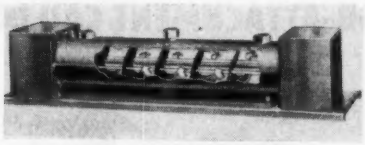
Engineering recognizes no stone walls. The same engineering ideas – indeed, the same equipment and materials – are being used today in many kinds of food plants. Only yesterday, these plants were separated into "industries." Today, engineering makes them *one* industry, as the "case history" at left so dramatically shows.

Only one magazine – FOOD ENGINEERING – is specifically designed to keep you on the crest of this tidal wave. It reaches into *every kind* of food plant for cost-cutting, quality-building ideas for *you.* And behind it – sifting new ideas in electronics, machine design, materials-handling, maintenance, and hundreds of other live subjects – are the unmatched facilities of industry's "headquarters for business information," McGraw-Hill.

Against this background, isn't it a pity about Waldin Smugg? He's inviting disaster. If you see him, warn him. If you see him in your mirror, subscribe to FOOD ENGINEERING.

Subscription rates on page 3

Electronic Device Sterilizes Water



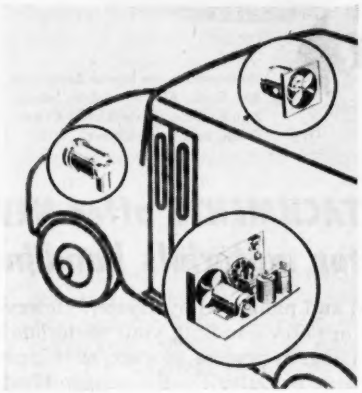
Of interest to large users of water—dairies, breweries, bottling plants—is this new electronic water sterilizer.

Capable of handling quantities up to 7,000 gph. this simple and compact sterilizer has no moving parts, weighs only 95 lb., and operates on 110v. 60-cycle a.c.

Sterilizer operates simply by guiding water by helical baffles into contact with a number of Westinghouse Sterilamps, which emit germ-killing ultraviolet rays. Lamps have a 6,000 hr. life. Stainless steel sterilizer is designed for ease of maintenance and lamp replacement.—*Aquafine Co., 1005 South Santa Fe Ave., Los Angeles 21, Calif.*

Circle 173A on Reader Service Card

Truck Refrigeration For 24-Hr. Service



Around-the-clock, full capacity, high-voltage refrigeration for light delivery trucks is now provided with use of a new electrical system.

Applications include use on trucks carrying milk, cheese, meat, ice cream, frozen foods, produce, beer, soft drinks, and many other products. Operation is completely automatic and independent of driver.

System, designed to operate at full capacity off truck crankshaft whether engine is idling or running at maximum road speed, also can utilize standard 115v. 60-cycle house current when engine is not running.

Because it was developed to operate on high voltages, no extra motors or transformers are required when standby power is used, and maintenance costs are reduced. Battery power is not required at any time.

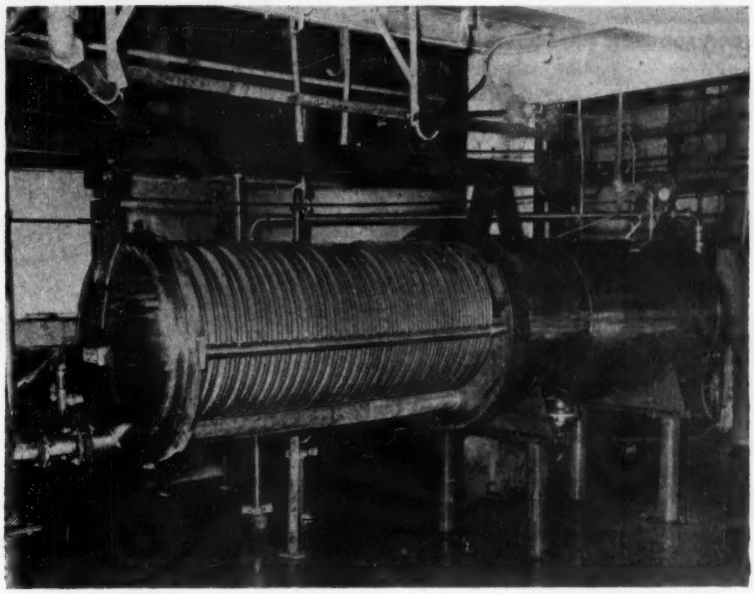
Maker's engineers point out that standby operation will allow fleet owners to load up their trucks in the afternoon for next day's delivery. Night shifts can be eliminated and better delivery schedules made possible. In addition, packing houses may be able to increase warehouse cooling space as well as radius of their distribution territory by using in-transit refrigeration.

Field tested, a prototype of system has been in operation since last Spring on a milk delivery truck. It has performed all over the country under adverse hot-summer conditions.

Five components make up electrical unit: A heavy-duty alternator which is mounted on a truck engine and is belt-driven from crankshaft; a small d.c. motor to drive evaporator blower; a voltage regulator which maintains constant system voltage completely independent of wide engine-speed variations; a compressor drive motor; and a selenium rectifier to serve double-duty in providing d.c. voltage to system from engine-driven alternator as well as from 115v a.c. standby source. —*General Electric, Schenectady 5.*

Circle 173B on Reader Service Card

Filters Beer at 1,000 Bbl. Per Hr. Rate



Higher operating efficiencies are claimed with use of this new larger size, horizontal filter having a capacity up to 1,000 bbl. of beer per hr.

New unit may be used on fermenter beer, wort, or final-polish beer. Larger unit size is reported to save precoating time, eliminate need to precoat several units, reduces need for pumps, piping, and general maintenance and labor cost.

Capacity is obtained, without increasing headroom requirement, by means of horizontal tank design. Stainless-steel vertical leaves are spaced in filter at intervals conforming to individual users' solids requirements. Maximum cake space can be provided for those who require it. Where cake space is not critical, more leaves can be provided for maximum flow capacity. A wide range of tank sizes is available, with capacity ranging from 100 to 1,000 bbl. per hr.

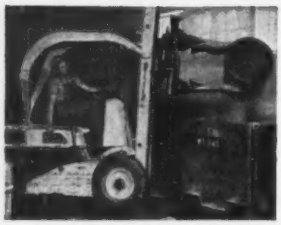
Filter aid and impurities are discharged from unit in a wet or semi-dry state, as preferred. Semi-dry disposal of cake is recommended for areas where stream pollution is or may become a problem.

One man can remove cake from filter in 10 min., without heavy labor. Unit is equipped with a quick-opening cover that opens or locks pressure-tight, with one easy motion. There are no cloths to remove, handle, and replace, and no heavy units or parts to lift while cleaning filter. — *Niagara Filters Div., American Machine and Metals Inc., East Moline, Ill.*

Circle 173C on Reader Service Card

IS YOUR JOB HARD TO HANDLE?

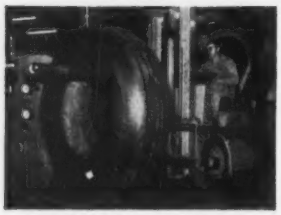
LOOK AT WHAT ONE HYSTER JOB-ATTACHMENT CAN DO



REVOLVING LOAD-GRAB

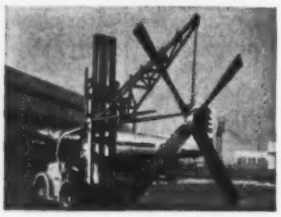
SCOOP, FOR LOOSE MATERIALS

PULPWOOD BOOM

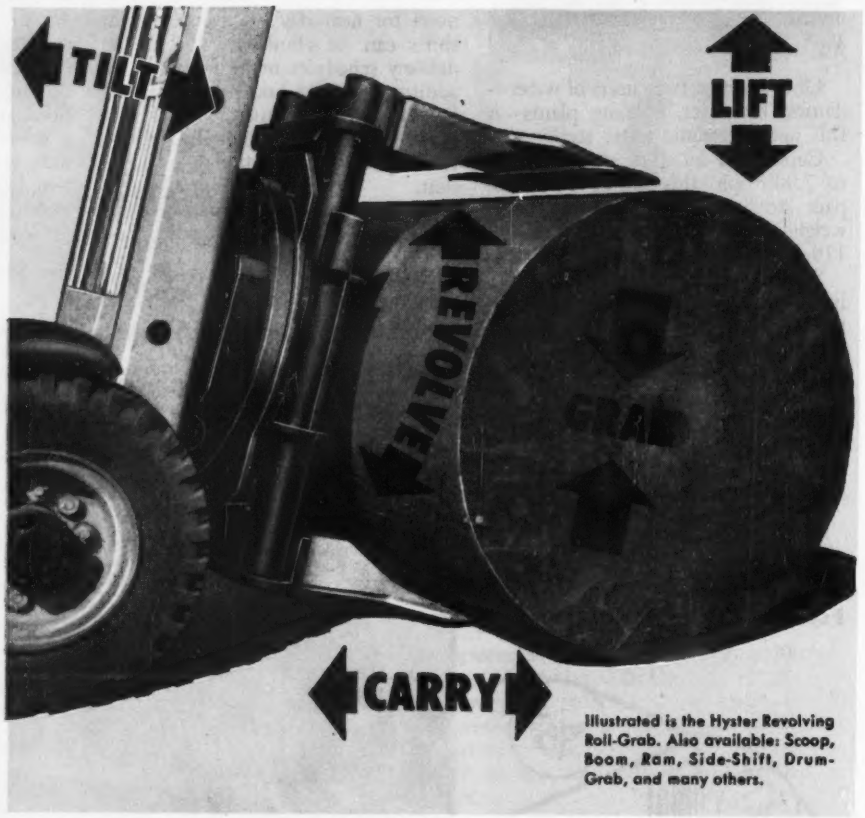


RAM, FOR ROLL SHAPES

LOAD-GRAB FOR CRATES, BOXES



BOOM, AS MOBILE CRANE



Illustrated is the Hyster Revolving Roll-Grab. Also available: Scoop, Boom, Ram, Side-Shift, Drum-Grab, and many others.

...over 100 HYSTER® JOB-ATTACHMENTS offer NEW WAYS to save money by better materials handling

"You can handle just about *anything* with a Hyster Lift Truck and the right job-attachment," say experienced operators. Hyster records, covering practically every industry, bear this out. They show that the right Job-Attachment greatly speeds handling, often makes possible greater use of lift trucks...thus realizing more of the basic advantages of lift truck operation. In many cases, Hyster Job-Attachments eliminate need for pallets, *saving even more money!*

The Load-Grab® is only *one* of many basic lift truck Job-Attachments developed and pioneered by Hyster. However you are now handling your materials at receiving, in-process, storage, or shipping — inside or outside — the proper Hyster Job-Attachment can reduce your handling costs *still further!* Your Hyster Dealer will be glad to show you how. Every one should have Hyster Attachments Catalogs 1266 and 1219. Write:

HYSTER COMPANY
2902-35 N. E. Clackamas.....Portland 8, Oregon
1010-35 Myers Street.....Danville, Illinois

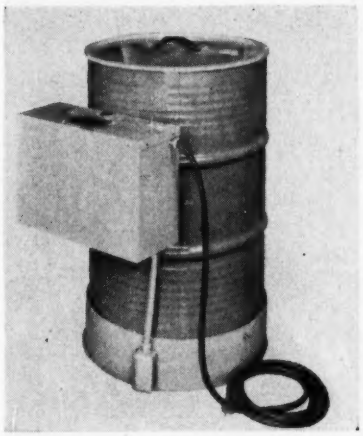
HYSTER

"Every Hyster Dealer is a Lift Truck Service Station"

THERE'S PROFIT IN HYSTER POWER

HYSTER COMPANY • FOUR FACTORIES: PORTLAND, OREGON • DANVILLE, ILLINOIS • PEORIA, ILLINOIS • NIJMEGEN, THE NETHERLANDS

Individual Degreaser Speeds Cleaning



Fast, economical and thorough cleaning of industrial parts is claimed with a new small individual degreaser called the Baronet.

Rapid cleaning of parts is accomplished in non-inflammable trichlorethylene vapors. Oily and greasy parts are simply lowered into the vapor zone of this barrel-type degreasing unit and deep and thorough cleaning is effected in less than a minute. Vapors quickly penetrate crevices, leaving parts clean, warm, dry and ready for further processing. Parts are never subjected to dirty cleaning solvents.

Compact in design, the portable unit is stated to operate with same effectiveness as larger type industrial degreasers. These individual units require smaller operational space and can be conveniently installed in each work area. Single units can be easily moved from job to job within an operating section or shop. Special air-cooled condensers eliminate water connections, allowing use of degreasing units wherever electric power is available.

Degreasers require 5 gal. of cleaning solvent for effective operation. Reclaiming of dirty solvent for reuse is one of the foremost features of the new equipment. This process is accomplished automatically by an air-cooled condenser which also controls vapor height. Clean, pure vapors are generated by electric elements mounted in base of assembly, and a thermostatic control insures operational safety and provides maximum economy.

Degreaser is a standard 50 gal. barrel-type unit with a wide working area, 23 in. in dia., and vapor depth of 18 in. Unit is complete with a 2 kw. electric heating unit, condensing chamber, thermostat, 15-ft. plug-in cord and unit cover.—*Baron Industries, 241 West Avenue 26, Los Angeles 31, Calif.*

Circle 175A on Reader Service Card

Milk Receiving Scale Adjustable Two Ways

This new Model 2361 milk receiving scale is adjustable both vertically and horizontally.

Supporting legs are regularly adjustable from 3 to 5 ft. in height. Wider spacing of suspension rods permits use of a greater variety of weight can sizes. Spacing of supporting legs is available from a minimum of 46¼ to a maximum of 78 in. accommodating weigh cans up to 61 in. wide. Front-to-back spacing of suspension rods has been increased to a minimum of 20 in. eliminating inaccuracies caused by swaying weigh cans and shifting of contents.

Full-floating, double pendulum mechanism features one-piece sectors of die-cast aluminum, sanitary construction.

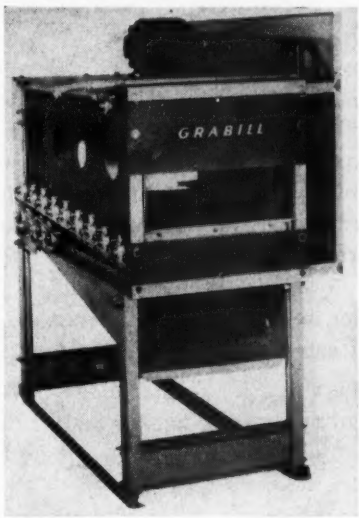
Dial head can be installed at any of eight indexed points at 45 deg. intervals on a full circle. Sealing features provide protection against steam and water. An oil seal is located in dial head for this purpose, and gaskets are placed at metal-to-metal joints. A heating unit in dial housing prevents moisture condensation and fogging of glass.

Aluminum spray finish on Bonderized exterior surface of castings is applied over a rust-inhibiting primer, resulting in long-life to metal parts.

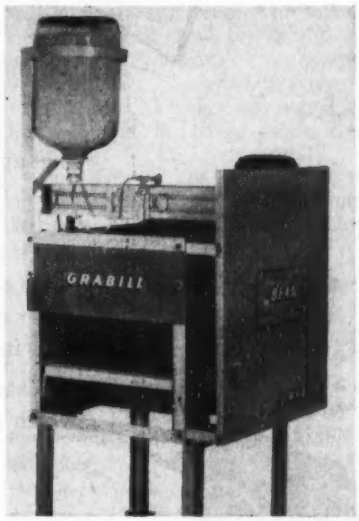
Scale is also available with Printweigh, which provides added advantage of eliminating chance of human errors in reading, remembering and recording of weights.—*Toledo Scale Co., Telegraph Road, Toledo 1, O.*

Circle 175B on Reader Service Card

Automatic Units Wash, Wax Fruits, Vegetables



Clean, highly glossed tomatoes, cucumbers, peppers and other fruits and vegetables that command premium prices can easily be prepared on these new small-volume machines. Economy size units are designed especially to meet needs of small grower.



Washer-absorber (left) is available with either hair or rubber brushes. Hair brushes are recommended for more tender produce such as tomatoes, peppers, cucumbers, and apples while rubber brushes are suitable for durable vegetables like white and sweet

with WALSEAL®

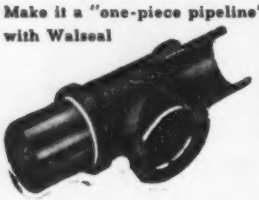
...and you can *see* that it's made right. When you make a WALSEAL joint the fillet of silver brazing alloy that appears at the face of the fitting is your assurance of full penetration and a permanently leak-proof joint that's vibration proof and corrosion-resistant . . . won't creep or pull apart under any conditions that the pipe itself can withstand.

Walseal is a registered trade-mark which identifies valves, flanges and fittings manufactured by the Walworth Company. Walseal products have *factory-inserted* rings of silver brazing alloy in threadless ports. Joints made with Walseal products are silver brazed and actually make the system a "one-piece pipeline."

Your copy of Circular 115 giving details on Walseal valves and fittings will be sent on request... send for it or see your nearby Walworth distributor.

SEE OUR CATALOG IN SWEET'S

Make it a "one-piece pipeline" with Walseal



WALWORTH

valves and fittings

60 EAST 42nd STREET NEW YORK 17, N. Y.

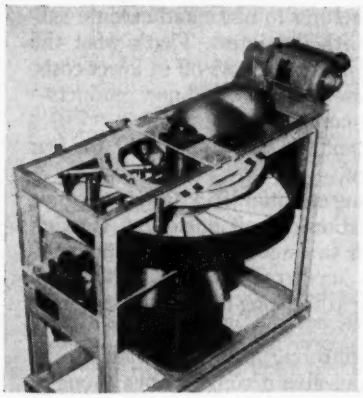
DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

potatoes. Unit should be used in packing line near receiving end, and works well in lines from 12 to 24 in. wide. It is independently powered and simple connections make it ready for use.

New waxer (right), economical to operate, is automatic in operation with only occasional attention demanded to adjust control valves or refill wax container. Waxer should be installed in line following washer-absorber. Both units have capacities ranging from 100 to 170 bu. per hr.—*John Bean, Div. of Food Machinery and Chemical Corp., Lansing 4, Michigan.*

Circle 175C on Reader Service Card

Rotary, Vacuum Filter For Fast Dewatering



High capacity, fast dewatering and excellent cake washing are reported with use of this new horizontal rotary vacuum filter. Unit is designed for simple and efficient filtering of coarse crystalline materials, fibrous pulps, and other free-filtering applications.

Machine features a protected, central-mounted drive which eliminates foundations and reduces maintenance costs. Design also permits totally-enclosed and other special constructions where required.

Filter is basically simple in design and operation. It consists of a revolving table or pan, inside bottom of which is divided into wedge-shaped hollow sections covered with filter cloth or screen. Each section is connected to a valve mechanism that progressively controls dewatering, washing and discharging operations as table rotates.

At feed point, slurry or pulp flows evenly onto surface. Liquid is drawn out through filter media by a combination of gravity and vacuum, leaving a thick cake of solids in pan. Cake then passes through one or more washing stages, where wash liquor is evenly flooded over surface and is rapidly drawn down through cake.

After final dewatering, cake is removed by a revolving scroll and dropped into a chute or conveyor. Filtering and washing operations are clearly visible at all times.

Filter's driving unit is self-contained, mounted in main frame. This eliminates separate foundations and even permits skid-mounting of smaller units where greater plant flexibility is desired. Main bearing and drive units are enclosed, protected from splash and corrosion. All units are readily accessible for easy servicing.

Unit illustrated has 3 ft. dia., 7.6 sq. ft. of filtering area. Weight is approximately 1,600 lb. Larger sizes up to 110 sq. ft. are available.—*Filtration Engineers, Inc., 155 Oraton St., Newark 4, N. J.*

Circle 177A on Reader Service Card

New Chemicals

New Antioxidant Keeps Peeled Potatoes White

Advantages in the processing of potatoes is claimed with use of a new antioxidant called Whitato.

New product is reported to keep peeled potatoes white for periods ranging from four to six days without having to be stored in water. Its use is also stated to improve flavor and color, and effect savings in cooking oils. Product can also be employed for apples, bananas, egg plant and other similar fruits and vegetables which are subject to discoloration.

In application, 1 lb. of product will process 3,200 lb. of potatoes. Material is packaged in 1 and 5 lb. bottles, and 25 and 100 lb. containers.—*L. L. Antle & Co., Atlanta, Ga.*

Circle 177B on Reader Service Card

New Product Provides Butter Flavoring

Fresh, natural butter effect is claimed with use of a new flavor product recently developed.

Called Buttatone, new compound, from which harsh, synthetic character has been eliminated, has wide application in food industry. It can be used to advantage on following products: candy, gums and jellies, fondants, cream centers, ice cream, dairy products, oleomargarine, spreads and shortenings, baked goods, icings, fillings, syrups and toppings, chocolate products, package desserts, cake mixes, soup mixes, canned food products.

New product is a concentrated water-soluble flavor, based on a pure milk starter distilled, and supplemented with aromatic materials. The following suggestions may be helpful in evaluating the product: oleomargarine, 4 oz. per 100 lb.; chocolate syrup, 1 oz. to 5 gal; chocolate coating, 2 to 4 oz. per 100 lb.; baked goods, 2 to 4 oz. per 100 lb.

Compound is also available in an oil soluble form.—*Dodge & Olcott, Inc., 180 Varick St., New York City 14.*

Circle 177C on Reader Service Card

OTHER DEPARTMENTS Featured in This Issue

Practical Ideas	page 5
Editorials	178
New Packages & Products	184
Advances in Technology	193
Questions & Answers	206
Useful New Books	220
Keeping Up With the Field	223
Recent Inventions	232
Men & Companies	235
Just Off the Press	239

In Behalf of Progress . . .

1954 Can Be Best Year for Food Manufacturers

Will 1954 be a good year for the food manufacturing industry?

We think so—at least for those with the foresight to see their opportunities and the courage to capitalize upon them. But it will not be an easy year, certainly not one in which you can coast.

Let us take a look at the general business outlook, as forecast by a prominent economist who has a record of being right—Dexter M. Keezer, chief of McGraw-Hill's economics department.

1953 ended with business generally at a high level. But industrial production was sliding gradually, having receded from the boom 243 level in March to about 230 in November, as measured by the Federal Reserve Board index. Durable goods took the lead in this decline.

In short—the boom was tapering off. Mr. Keezer sees a continued slow slide, *with emphasis on the slow*, at least for the next six months. And the Federal Reserve index of industrial production (as presently calculated) could go down to 220 by mid-year, 10% below last year's peak.

Here are the reasons: Manufacturers' inventories are still high. Manufacturers' sales are not being matched by new orders. And no sharp upturn in orders is in prospect.

But much of the sting is taken out of these negative factors by this fact: There is important evidence, in both consumer and industrial fields, that no drastic production cutback will be necessary in the near future. Demand still is reasonably high.

Automobile manufacturers—who are old hands at feeling the pulse of the consumer's pocketbook—plan to build 3,000,000 cars in the first half of this year—almost as many as in early 1953.

So it would seem to us that food manufacturers don't have to worry about lack of grocery-budget money. The current high level of spending for quality and convenient processed and packaged food should hold up well. And, of course, the number of food consumers is increasing at a nice rate.

But what about food manufacturing costs? With farm prices down, and likely to go somewhat lower under pressure of surpluses, raw material costs should be more favorable this year. But the labor bill likely will move in the other direction.

Indications are that many unions will demand increases of 10c an hour, plus fringe benefits. However, compromise settlements for less are expected. The "fringes" can be rough. Some food manufacturers already are paying 25% of their labor costs in the form of "extras."

Other costs, including transportation, equipment, and supplies, likely will be fairly stable. Prices in general have leveled off. And there seems little likelihood that inflation will be revived.

Total food manufacturing costs may well ease a little in 1954. Aided by lower excess profits taxes, this will permit some improvement in the too-low profit margin of the industry. Of course, expansion of distribution services to meet competition easily could more than nullify the gains.

There is a bright side to wage increases, too. They put more food buying power in the hands of millions of consumers. This should offset a decrease in overtime pay and some increase in unemployment.

All factors considered, 1954 looks like a good time for the food manufacturer to make and execute substantial plans for further progress. That's what the pace-setters will do, because it pays off in lower costs, better quality, increased capacity, and new products—in short, a stronger competitive position.

This certainly is not the year to sit tight for fear of a serious recession.

Number one among essential 1954 steps to progress is further modernization of unit operations through *engineering research* in large companies—and engineering analysis in smaller enterprises. The quick pay-off can be as big as the long-term penalty for not doing it.

If the idea of engineering research happens to be relatively new to you, give it some serious thought. We know of at least one leader in scientific food research who rates engineering investigation as the one thing above all that the food industry needs to do in a big way. For only from it can come the know-how and the means to replace high-cost traditional methods with efficient operations.

Scientific research to improve existing products, processes, and packages, and to develop new ones, is number two in importance. Not only is this good business insurance, but it can cut costs and increase sales.

The $17 million invested in research by General Foods since the war produced new products which last year contributed $116.5 million to the company's sales. In addition, countless improvements were made in GF brands and processes.

Rather a sound investment.

Improvement in employee productivity through better industrial relations, work simplification, safety, incentives, and training of supervisors and foremen comes next in the parade of progress in 1954.

This you can do, no matter how small your plant. And this you must do. The era of cheap and plentiful labor is long since gone.

So roll up your sleeves and wade in. 1954 can be the best year you ever had!

Melon Rind Items

—Continued from page 47

15-min. intervals. It is best to discard the calcium hydroxide solution each time.

If rinds are directly used, they must be parboiled immediately. If not, then a preservative can be added after freshening.

Parboiling is a continuation of the freshening process. It is necessary in order to produce the desired texture, color, and translucent appearance and to make the rinds "take the sugar" in the next operation. Parboiling can be carried out by boiling three successive changes of water at 15-min. intervals. Rinds are now ready for processing into seven different products.

Holding for Processing

Since harvesting and initial preparation of rinds are seasonal, it is often desirable to hold the melons or prepared rinds for several days, or even months, before using them.

Refrigerating whole watermelons at 36 to 40 deg. F. provides an excellent means of holding for as long as two weeks. Melons stored more than five days at room temperature lose their crispness, and they become slick and eventually soggy.

Crushed ice keeps prepared rinds in excellent condition for four days, while rinds held at room temperature lose their crispness and begin fermenting in a few hours. Method found most suitable: Place alternate layers of rinds and crushed ice in an insulated metal box and then re-ice daily until used.

Benzoate of soda solution provides a suitable means for storing prepared rinds. Preserves made from rinds held ten months in this manner are almost as good as those prepared from fresh ones. Best way to store rinds in benzoate of soda: Place them in glass, wood, or stainless steel containers; cover with water; add 0.1% benzoate of soda (based on net contents of the container); adjust pH of solution to 3.0 by adding citric acid (approximately 0.5% of the solution weight); and seal containers.

The pH should, if necessary, be readjusted at the end of the first and second weeks by adding more citric acid. For example, 10 lb. of rinds and 1 gal. of water require approximately ¼ oz. of benzoate of soda and 1½ oz. of citric acid.

Rinds spoil when held in benzoate of soda solutions ranging from a pH of 4.3 to 4.5. No spoilage occurs in packs held at a pH of 2.5 to 3.9.

MODERN DRIVES
You get exactly the right type of drive to meet the imposed operating conditions and economic factors.

METAL-TO-METAL SEALS
Standard-Hersey dryers offer an exclusive metal-to-metal seal. Prevents in or out leakage with a minimum of friction and attendant increase in power.

COMPLETE CHOICE OF MATERIALS
Standard-Hersey dryers are available in any material necessary to meet your product and service requirements.

DEPENDABLE RUNNING GEAR
You are assured trouble-free performance under the most adverse thrust and load conditions. Ample allowance is made for expansion, both radial and linear.

COMPLETE CONTROL
Our thorough knowledge and extensive experience in control application assures you the most practical and dependable controls.

ANTI-FRICTION BEARINGS
You may specify anti-friction bearings for heavy load, long-operating dryers. The small additional cost is soon repaid.

FUNCTIONAL DESIGN
Sound functional design increases operating efficiency, reduces power needs, simplifies cleaning.

Send for FREE *12-page bulletin giving full dryer information and details about our pilot plant testing of your product.*

STANDARD HERSEY *Dryers*

STANDARD STEEL CORPORATION
5001 Boyle Ave., Los Angeles 58 • 7 E. 42nd St., N. Y. 17

E2

For more information, use coupon on page 209.

worth of

DOW CORNING ANTIFOAM A

kills foam in:

300 lbs. of butadiene-styrene latex
1500 lbs. of maple-cane syrup
1000 lbs. of phenolic resins
400 lbs. of casein adhesive
500 lbs. of floor wax emulsion

and

- **Saves space now wasted on foam in process equipment.**
- **Cuts processing time.**
- **Eliminates the waste and fire hazard of overflowing foam.**
- **Nontoxic and safe to use, Dow Corning Antifoam A is the most versatile and efficient defoamer on the market.**

DOW CORNING ANTIFOAM AF EMULSION

This water dispersible emulsion of Antifoam A is equally versatile, equally effective in the industrial processing of aqueous foamers.

see for yourself!

mail coupon TODAY for free sample

DOW CORNING SILICONES

Dow Corning Corporation
Midland, Michigan,
Dept. BF-13

Please send me data and a free sample of
☐ Dow Corning Antifoam A
or ☐ Dow Corning Antifoam AF Emulsion

NAME_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE____ STATE____

Before cooking, the benzoate can be removed by soaking the rinds in water for 24 hr., with at least three water changes.

Salt brine is also suitable for holding watermelon rinds for future use. Best results are obtained by placing rinds in glass or wooden containers and covering with 85-deg. salinometer brine (2½ lb. of salt per gal. of water), adjusting salt concentration every two days to maintain above 60-deg. salinometer, replacing brine after two weeks with fresh 85-deg. salinometer brine and sealing the container, and removing salt from bleached rinds after storage by soaking approximately 36 hr. in water that is changed three times.

Preserves made from rinds held 10 months in brine were rated satisfactory, although the quality was lower than that of preserves made from fresh rinds.

Optimum concentration of SO_2 to keep rinds is approximately 1,500 ppm. Concentrations as high as 2,200 ppm, result in soft and even mushy rinds when cooked.

Best procedure for SO_2 preservation: Place rinds in a wooden or glass container and cover with a solution containing 3,700 ppm. of SO_2; seal containers watertight, turn once daily, and, if necessary, adjust SO_2 solution to 1,500 ppm. after four days; and remove SO_2, after storage, by boiling rinds 2 hr. in several changes of water.

Freezing proved unsatisfactory. Rinds frozen at 0 F.—unpeeled, peeled, peeled and packed in a .05% calcium hydroxide solution, and peeled and firmed—were flabby and tough after defrosting.

Watermelon Rind Products

Formulas were set up for preserves, pickles, glace rinds, jam, conserve, and relish.

Preserves are crisp, translucent, and delicate in flavor. They command a premium price.

To prepare them, firm, freshen, and parboil rinds. Add in steam-jacketed kettle 10 lb. of prepared rinds, 17½ lb. of sugar, and 2 gal. of water, and boil moderately for 1 hr., with occasional stirring. Now add 1 oz. of citric acid and continue boiling at a slower rate for an additional 30 min., or until rinds are translucent, light amber in color, and the syrup temperature reaches 224 F., or a soluble solids of 68 to 70%. (Sliced lemons, 1 lb., or imitation lemon juice base, 2 oz., may be substituted for the citric acid.) Cool slightly (210 F.) and loosely pack in hot jars, cover with syrup, seal, and rapidly cool. Yield: 36 jars (10 oz.).

The sugar-fruit ratio largely determines the yield of finished product. For example, when the amount of sugar is reduced to 12½ lb. and the rinds are firmly packed in jars, the yield is 27 jars.

Pickles are similar to preserves, except the syrup is lighter, and vinegar and spices are added. They are preferred to preserves by those desiring a less sweet or tangy product.

To make them, add 10 lb. of prepared rinds (firmed, freshened, and parboiled) in a steam-jacketed kettle along with 2 gal. of water, 12½ lb. of sugar, and 7 pt. of white vinegar (4% acetic acid).

If whole spices are used, tie in a cloth bag and add, at this time, 10 teaspoons each of allspice, cinnamon, cloves, and ginger. If essential oils are used, add 1 drop of each after other ingredients for the first hour, boil moderately, and continue boiling slowly for another 30 min., or until the rinds are translucent, amber in color, and the syrup reaches 219 F., or 55 to 60% soluble solids. Pack loosely in hot jars, cover with syrup, seal, and cool rapidly. Yield: 28 jars (10 oz.).

Red or green coloring (1 teaspoon) add attractiveness to the product, without altering texture or flavor.

Use white vinegar if light-colored pickles are desired. Essential oil of cloves, instead of whole or ground cloves, greatly reduces darkening of the pickles.

Spiced rinds differ from pickles in that preparation time is reduced by 2 hr., packing into jars is easier, and the product is cooked after it is packed into jars.

This product is made by dissolving, with heat, 12½ lb. of sugar in 5 lb. of vinegar (10% acetic acid). Then there are added 10 drops each of the essential oils of allspice, cinnamon, cloves, and ginger. Prepared rinds (firmed, freshened, and parboiled) are packed in jars, covered with hot syrup, sealed and cooked under 10 lb. of pressure (240 F.) for 30 min. Yield: 30 jars (10 oz.).

Glace rinds are similar to glace citron fruit and are used in fruit cakes and other products.

To prepare them, dissolve 6¾ lb. of sugar and 9 lb. of corn syrup (73 deg. Brix) in 3 qt. of water in a jacketed kettle. Add 10 lb. of prepared rinds (¾-in. cubes) and boil 10 min. Turn off heat and allow to stand 2½ hr. Now add 1½ lb. of lemon slices and boil an additional 45 min., or to a soluble solids content of 77%. Place rinds on a screen and dry by circulating warm air (110-120 F.) for 3 to 4 hr. Roll in dextrose sugar, pack in moisture-proof containers, and store in a cool place. Color, if desired. Yield: 10 lb.

Jam is similar to preserves, except the rind pieces are smaller, product can be spread more easily, and there is little or no free syrup. It is the simplest product made from small, misshapen rind pieces.

Preparation calls for parboiling 10 lb. of rinds and grinding coarsely with 2 lb. of lemons. Rinds and lemons are added to a steam-jacketed kettle along with 8 lb. of sugar and 1 gal. of water. The batch is slowly cooked for 1 hr. When the mixture becomes thick, translucent, and the temperature reaches 221 F., or has 65% soluble solids, fill into jars, seal, and then rapidly cool. Yield is 21 jars (10 oz.).

Jam made from firmed rinds is granular and the individual pieces are crisp or crunchy. When made from unfirmed rinds, the jam is smoother, and it may be more easily spread.

Conserve has a definite fruity and nutty flavor, and can be spread as a jam.

It is prepared by cooking 10 lb. of parboiled, coarsely ground rinds, 1 lb. of coarsely ground oranges (whole), 2 oz. of lemon juice, and 1 qt. of water for about 20 min.—or until the rinds are tender. After adding 10 lb. of sugar, 1¼ lb. of ground white seedless raisins, and 1 qt. of water, the batch is rapidly boiled for an additional 30 min., or until the mixture is thick and the temperature reaches 221 F. (with 65% soluble solids). Finely chopped pecan nuts (1 lb.) are mixed into the batch, and the product is filled into hot jars, sealed, and rapidly cooled. Yield: 26 jars (10 oz.).

Making Relish

Relish is a highly flavorful, colorful product that is excellent for serving with meats, green vegetables and other dishes.

To make it, coarsely grind 10 lb. of parboiled rinds, 6 lb. of onions, and 4 lb. of peeled pimientos. Add ground ingredients to jacketed kettle along with 6 tablespoons of white mustard seed, 2 tablespoons of red hot pepper (ground), 2 teaspoons of celery seed, 10 drops of clove oil, 2 tablespoons of salt, 8 lb. of sugar, and 1 gal. of white vinegar. Slowly boil batch 1 hr. When mixture becomes thick and the temperature reaches about 215 F., pour immediately into hot jars, seal, and then rapidly cool. Yield is 37 jars (10 oz.).

The above feature was based on the paper, "Watermelon Rinds in Food Products," which was authorized for publication as Technical Paper No. 248, Journal Series of the Georgia Experiment Station. Aiding in the research were Silas Harmon, Coastal Plain Experiment Station, who grew

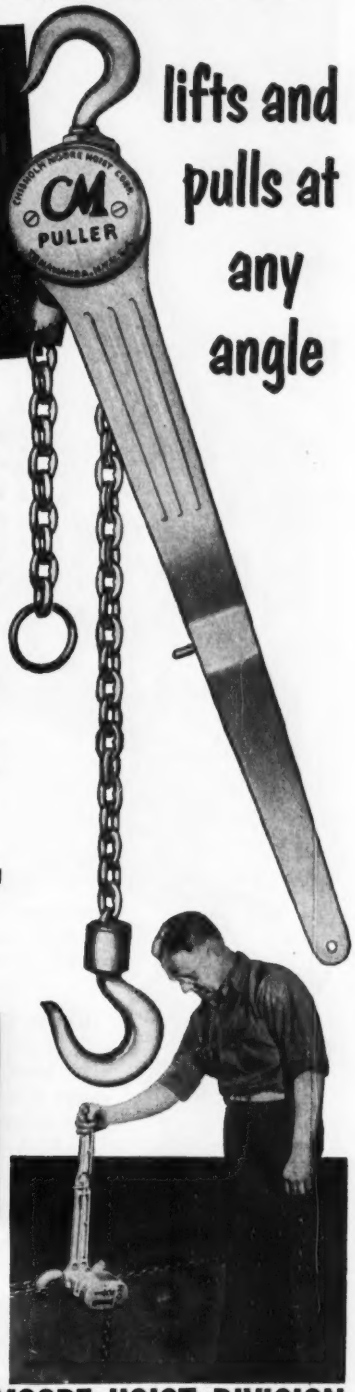
The tool with 1001 uses

Moving machinery, pulling boiler tubes, joining belts, setting pipe, lifting motors and for untold other uses nothing is so handy as the CM Puller. Light weight, compact and inexpensive. Takes but a minute to put into service. Eliminates slow, and often dangerous, makeshift methods.

CM PULLER

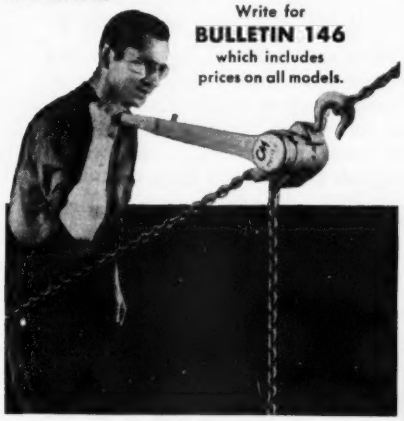
CAPACITIES: ¾ TO 6 TONS

lifts and pulls at any angle



Operated by a ratchet handle, requiring little more effort than an automobile jack, objects up to 12,000 lbs. can be lifted or pulled vertically, horizontally, or at any angle. Sturdy and dependable for long service. FAST—Free wheeling permits quick adjustment of load chain. AUTOMATIC BRAKE—Holds load at any point. LIGHT WEIGHT—Easily carried. ¾ ton model weighs only 13 lbs. "HERC-ALLOY" LOAD CHAIN—For maximum strength and flexibility in use. LIFETIME LUBRICATED—No attention required. Simple, fully enclosed mechanism.

Write for **BULLETIN 146** which includes prices on all models.



ANYONE CAN OPERATE and every plant should have several of these inexpensive CM PULLERS handy for the general maintenance crews.

Ask your CM Distributor to show you the CM PULLER

CM HOISTS AND CHAIN

CHISHOLM-MOORE HOIST DIVISION
COLUMBUS McKINNON CHAIN CORPORATION
TONAWANDA, NEW YORK
DISTRICT OFFICES: NEW YORK, CHICAGO, CLEVELAND
In Canada: McKINNON COLUMBUS CHAIN LIMITED, ST. CATHARINES, ONT.

For more information, use coupon on page 209.

Are you needlessly using two different machines when one Elec-tri-pak will do the job? Or, are you holding off automatic packaging because you think more than one filling machine is needed? You don't need to!

With a Triangle Net Weighing and Filling machine, you can fill any number of product varieties on a single machine . . . cello and foil wraps, coconut rolled items, sanded jelly items, panned eggs, and others. You can fill into any type container.

Chase Candy Company's Experience

For example, the Chase Candy Company fills at least 58 candies with just ONE of their many Elec-tri-paks. Weights may range from a few ounces to a few pounds or more. And, change-over is made from one to another in a few minutes!

Solve your problems with Elec-tri-pak equipment NOW. Get the complete facts in this new booklet, "Profitable Solution to Package Filling Problems." Write, wire or call.

TRIANGLE PACKAGE MACHINERY CO.

6637 West Diversey Blvd., Chicago 39, Ill.

SALES OFFICES: New York, Newark, Baltimore, Boston, Atlanta, Dallas, Denver, Los Angeles, Portland, Ore., Montreal, Mexico City

the melons for the variety studies; R. A. Hall, State Engineering Experiment Station, who built the peeler-shaper machine; and S. R. Cecil, Georgia Experiment Station, who assisted in chemical determinations.

End (Resume reading on page 48)

Bottle Cleaner

—Continued from page 33

pass from cleaner to the filling units, which are 50- and 60-spout machines with capacities of 225 and 330 bottles per minute, respectively. Bottles are positioned on individual platforms and elevated to connect with filling tube and sealing bell, where they are filled continuously as the machine rotates. Crowners cap and seal the bottles immediately after they leave the filling spouts. Then they are conveyed to the pasteurizer.

High-Load Pasteurizing

This unit is a Barry-Wehmiller Vortex regenerative type, double decker, fed by two conveyors. Speeds are adjusted at the infeed to crowd the bottles onto the "walking decks" in an upright position so that they pass through the different zones or stages of pasteurization in a continuous, solid mass at uniform speed. Temperatures throughout the operation are under rigid automatic control.

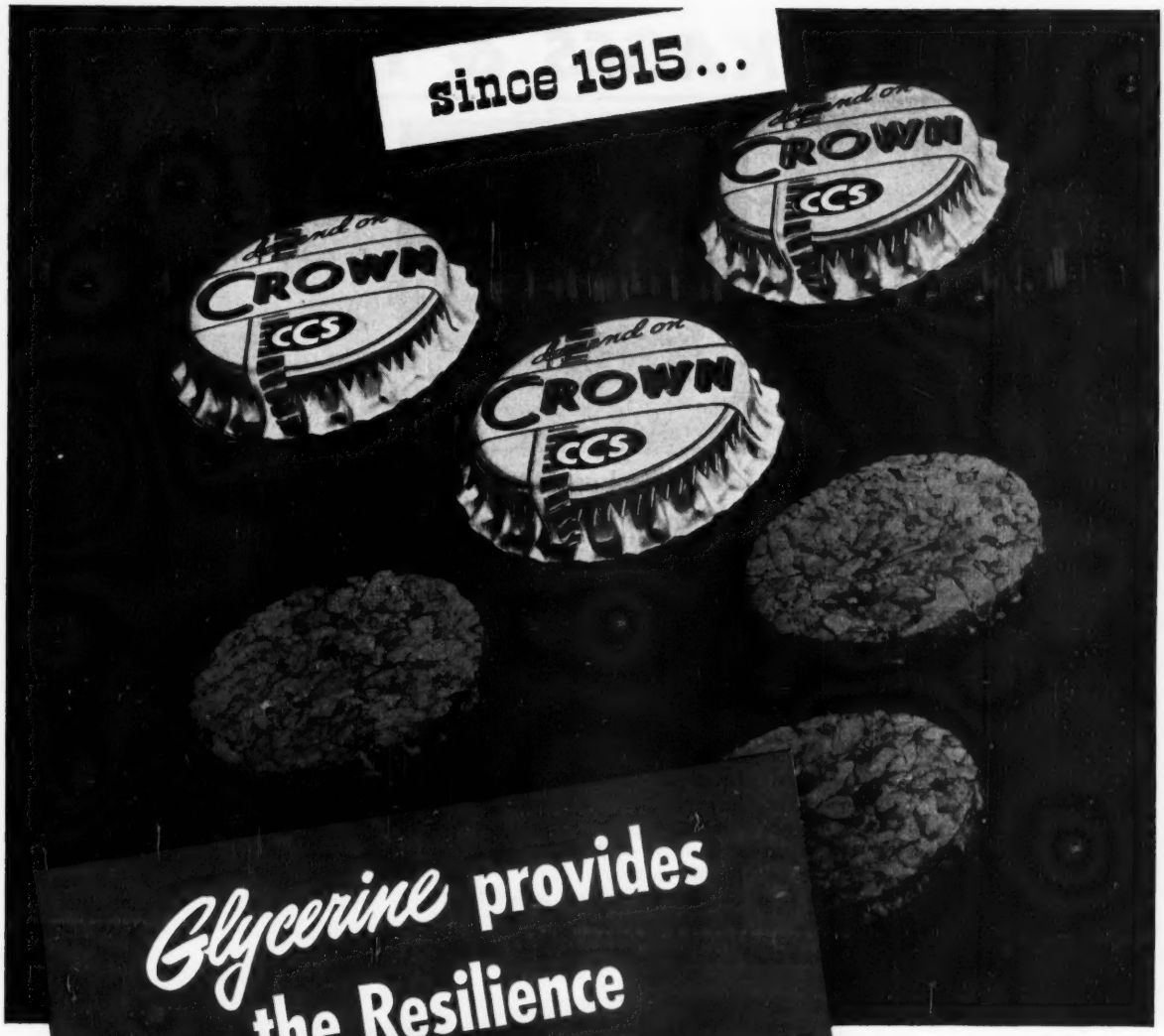
It takes approximately 52 min. for bottles to move through the pasteurizer which, under normal operations, has a continuous load of approximately 26,000 bottles. Discharge is continuous through platform chain conveyors onto a B-W rotary filer, which redirects the bottles through three inspection stations.

From here, the bottles move into three, 10-wide, 200 bpm., improved Ermold labelers, where body and neck labels are applied. And then they go onto conveyors that feed two Standard-Knapp packing machines. Cartons are conveyed from the 2nd floor to the machine operator, who places them on an air-operated elevator. As the carton is lifted, a trip is released allowing 24 bottles to drop through a spring steel grid. Filled cartons discharge to belt conveyors that feed two Ferguson automatic glueing and sealing machines. From here they are conveyed on belt conveyors to the shipping building.

While furnishing the additional facilities required for the Brading's products, it is of interest that the new line of 500-bpm. capacity occupies only slightly more floor space than the 220-bpm. unit which it replaced.

End (Resume reading on page 34)

For more information, use coupon on page 209.



Crown Cork & Seal Company Inc., originators and world's largest makers of crown corks, have used Glycerine for nearly 40 years. Glycerine helps to keep the binder in the cork discs supple, assuring a dependable seal and trouble-free bottling.

Two properties make Glycerine a natural for use in Crown Cork & Seal's composition cork discs. Glycerine helps keep the discs resilient, so that they provide a tight, long-lasting seal.

What is equally important, Glycerine is non-toxic. It is accepted by medical associations and government agencies as safe for use in contact with foods.

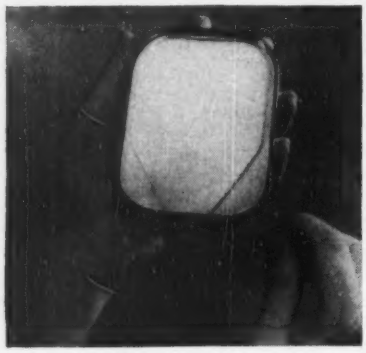
Indeed, U. S. P. Glycerine is an important *ingredient* in many confections, flavoring agents, and other food products. Versatile Glycerine can serve as a sweetener, solvent, or blending agent. Its high viscosity imparts smoothness to mixtures, prevents graining.

A handy 16-page booklet, "Why Glycerine for Foods?" reviews Glycerine's unique range of properties and applications. For your copy, write Glycerine Producers' Association, 295 Madison Avenue, New York 17, N. Y.

Nothing takes the place of Glycerine

For more information, use coupon on page 209.

NEW PACKAGES & PRODUCTS



"Easy-to-Open" Feature Stressed by Packagers

Quick and effortless opening of packages by consumers appears as a feature in two recent developments.

American Can Co., Portland, Me., has introduced a No. ¼ oblong sardine can with a slotted key fitting into a lip on the can top.

Easily opened, the can is an improved version of the Norwegian style container. Replacing the former punch-and-roll opening can it has a drawn body with a double-seamed top. Although the Norwegian-style can was produced in the U. S. at one time when soldered ends were used, the Canco container is the first of the sanitary-type sardine can to be manufactured in the U. S.

Designed and produced by Milprint, Inc., Milwaukee, Wis., for Hahn Brothers, Inc., Westminster, Md., is a colorful bacon envelope with a handy tear-tape for opening the package. Consumer merely pulls tape, cut along dotted lines on sides, and a convenient and reclosable package remains.

A second feature of the bacon package is its colorful label. Since the bacon is "smoked over apple and hickory logs," a design resembling bark is printed in brown and white over most of the package. A transparent window presents product visibility and a space is provided for price marking.

For Package Data Use Reader Service, p. 209

New Catsup and Juice Labels

Labels for tomato juice and tabasco catsup products have recently been redesigned by P. J. Ritter Co., Bridgeton, N. J. Tomato juice packaged in a reusable decanter bottle, now features a red, blue, and yellow Cello-Seal neck-band label, instead of the previously employed standard body label.

Planned to emphasize eye appeal, the neck band is a product of E. I. Du Pont de Nemours & Co., Wilmington, Del.

Reynolds Metals Co., New York, is the maker of an aluminum foil label adopted by Ritter for tabasco-flavored catsup bottles. Color printed in red, yellow, and blue, it emphasizes the rich catsup color. Several features make the foil label suitable for catsup. Moisture condensation does not mar the label and the label can be wiped clean, if soiled.

For Package Data Use Reader Service, p. 209

Non-Moisture Proof Wrap

Solution to the problem of hard crust roll packagers in using moisture-proof cellophane, has been offered by Leo Rossi's, Trenton, N. J. Since hard rolls lose crispness in moisture-proof cellophane, Rossi's conferred with Sylvania Division, American Viscose Corp., who developed a non-moisture-proof cellophane, (P-1) that allows moisture within package to escape and yet maintains crispness. Marketed in a blue and white printed cellophane wrap, Rossi's Italian Rolls have remained fresh and crisp for longer periods than formerly possible.

For Package Data Use Reader Service, p. 209

Tea Taster's Kit

Four individuals cartons of black, green, jasmine and oolong teas are being packed by Mee Jun Mercantile Co., Chicago, in a "Hostess Tea

PROTECTED by Riegel

THE NEW NESTLE PACKAGE IS PRODUCED ON A BARTELT MACHINE FROM A WEB OF SPECIAL OPAQUE GLASSINE . . . HEAT-SEAL COATED AND GRAVURE PRINTED BY RIEGEL.

More than 600 Riegel Papers are now proving their value for many of the nation's best-selling brands. It is the greatest variety of packaging papers available from any one source.

Somewhere among this wide selection you may find a better or more economical paper to protect your product. If we don't have just what you want, we can usually "tailor-make" a new paper to your specifications.

Write us now and tell us what you want paper to do for you. Riegel Paper Corporation, P. O. Box 170, Grand Central Station, New York 17, N. Y.

Tailor-made Packaging Papers

Riegel

GLASSINES AND GREASEPROOFS

Plain • Waxed • Printed • Lacquer-Coated • Laminated

For more information, use coupon on page 209.

FOR MEN WHO USE WIRE MESH BELTS!

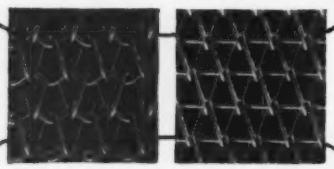
HERE'S WHY LEADING MANUFACTURERS SPECIFY "CAMBRIDGE" WIRE MESH CONVEYOR BELTS.

ACCURATE CONSTRUCTION—every step of the construction of your belt is carefully controlled so that the finished belt meets specifications for size, mesh count and mesh opening. Even the welds at the edge of the belt are specially inspected to give you maximum protection at this most vulnerable part of the belt.

RANGE OF SPECIFICATIONS—whether you're handling delicate lightweight loads, such as leaf crops, or heavy, bulky loads such as bagged feeds, there's a Cambridge wire belt specification to meet your needs. Even processing through heat, cold or corrosive solutions is a snap when the proper metal or alloy is chosen for fabricating your Cambridge wire mesh conveyor belt.

EXPERIENCED ENGINEERING SERVICE—the combination of trained engineers both in the Cambridge plant and on our Sales Staff is your assurance that the belt recommended for you is the right belt. Cambridge engineers can assist you in any phase of conveyor belt usage . . . conveyor design, plant layout, equipment specifications etc.

P. S.
IF YOU DON'T USE WIRE MESH BELTS, you'll do well to find out how they can cut costs and boost output by combining product movement with processing in your plant. For information write direct or call in your Cambridge field engineer. Look under "Belting-Mechanical" in your classified telephone directory for the Cambridge man nearest you.



Typical Cambridge Belt Weaves, Balanced and Rod-Reinforced, are widely used for many processes which can be combined with movement. Other Weaves available.

FREE WIRE BELT MANUAL
Gives data on design, installations, construction. Write for your copy now.

The Cambridge Wire Cloth Co.
Dept. Q • Cambridge 1, Md.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

Party" package designed by Robert Gair Co., Chicago.

Slanting sidewall gold foil tray, printed in red and black, holds the four cartons, also of gold foil with green, red, blue, and orange printing. A plastafol lid fits over the tray and holds cartons in place, while a chipboard sleeve offers protection during shipment.

For Package Data Use Reader Service, p. 209

Dietetic Ice Cream

A dietetic dairy dessert, called "dietfreeze", has been introduced by Maple Island, Inc., Stillwater, Minn.

Packed in a 4½-oz. can product when prepared according to directions on the can will make a low calorie, high protein frozen dessert, sufficient for four servings.

The wrap around label is in colorful red, yellow and blue, with a reproduction of an appetizing dish of ice cream. Also printed on can as a valuable aid to those on restricted diets is an approximate analysis of ingredients contained in the products with calorie content.

Calorie-Free Gelatin

A low-calorie, sugar-free gelatin dessert, D-Zerta, is currently being marketed by General Foods, makers of Jell-O. It is packaged in two sizes—ten envelopes of assorted flavors (strawberry, raspberry, cherry, orange, lemon, and lime) and three envelopes of assorted flavors. Each envelope makes two servings.

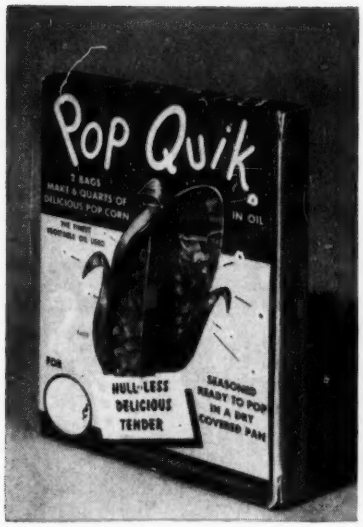
Though D-Zerta has been handled by institutions and health food stores for over 20 years, General Foods is now aiming at retail store trade through increased production.

New "Double-Raised" Biscuits

Pillsbury Flour Mills Co., Minneapolis, has introduced its double-raised biscuits in a cellophane wrapper designed by Milprint, of Milwaukee. Wrapper is printed in red, blue, yellow, and white and a play on the "double-raised" feature of product is made by printing the word "double" in a double-exposure effect in blue shadowed in yellow.

Featuring the "heat-and-eat" advantage, biscuits are packed, a dozen in a tray, ready for the oven. Biscuits are similar to baking powder biscuits, but have a slight yeasty flavor found agreeable by consumers.

For Package Data Use Reader Service, p. 209



Handy Popcorn Pack

A 2-unit popcorn package, called "Pop Quik", is now being marketed by Joyce Food Products, Patterson, N. J.

In addition to the convenience of having two separate packs enabling consumer to use one while the other can be kept sealed until ready for use, the corn kernels are packed in seasoned vegetable oil so that no other preparation is needed except to place them in a dry pan and heat for two minutes.

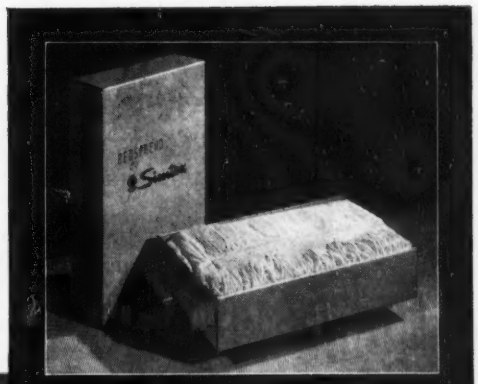
Product is heat-sealed in two pliofilm bags, each one containing enough to make three quarts of popcorn. Bags are placed in a chipboard carton (Standard Folding Cartons, Inc., Brooklyn, N. Y.) with a cut out window allowing complete visibility of product.

For Package Data Use Reader Service, p. 209

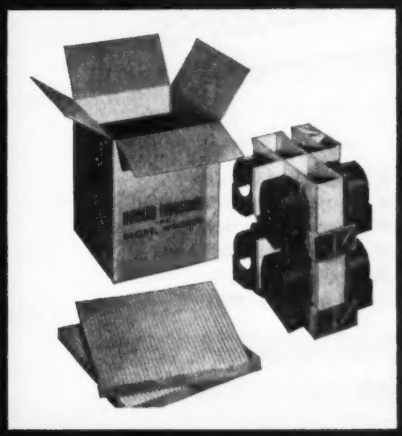
Chili Cone Carne

Salty-cracker cone filled with firm, meaty chili, are being introduced by the Chili Cone Co., Kansas City, Mo. The cone is said to remain crisp for long periods, and may be kept hot and ready to serve.

FAST
PACKING



SURE
PROTECTION



EASY
HANDLING

Do you know the five commonly used methods of sealing boxes? Write for your copy of booklet, "How To Seal Corrugated Shipping Boxes."

HINDE & DAUCH

Authority on Packaging

SANDUSKY 11, OHIO • 17 FACTORIES AND MILLS • 40 SALES OFFICES

Your REFERENCE COLUMN for

TRANSWRAP Machines

Complete Plant In One Machine!

- Lowest cost per unit
- Greatest product protection
- Completely automatic
- Attractive packages
- Flexible packages—Fin & Pillow types

3 basic machines

MODEL A—for smaller units with high production rates.
Pkg. Sizes: ¾" x 2" to 2⅝" x 6"

MODEL B—general purpose packaging machines for most jobs.
Pkg. Sizes: 1¾" x 2" to 5¼" x 12"

MODEL C—makes larger packages—and handles straight poly film.
Pkg. Sizes: up to 9½" x 14"

4 feeds

- Volumetric
- Auger
- Piston Pump
- Scale

HANDLES ANY PRODUCT IN THIS FULL RANGE OF FLEXIBLE PACKAGING MATERIALS

Cellophane • Coated Papers • Aluminum Foil
Pliofilm • Vinyl • Saran • Polyethylene

TRANSWRAP is a complete packaging plant in itself. It is a completely automatic operation giving you attractive, hermetically sealed packages at lowest possible unit cost. Investigate TRANSWRAP before you standardize on a packaging setup. A complete brochure of TRANSWRAP equipment is available, upon request. Contact us today!

TRANSPARENT Wrap Machine Corp.
HASBROUCK HEIGHTS, N. J.
Sales and Service in all principal cities of U. S. plus Canada, Mexico, South America & Europe.

"Poly" Potato Package

Dakota Chief potatoes are now being packaged in a printed Polyethylene bag produced by Milprint, Inc., Milwaukee. Marketed in 5 and 10-lb. sizes, bags are printed with an all-over blue-mesh design, with a wide white-stripe containing brand name and an illustration of an Indian in full headdress.

For Package Data Use Reader Service, p. 209

New Date Canning Process

Sunnipalms Date Gardens, Indio, Calif., is producing canned dates through a new and unique canning method. Previously, canned dates have proven impractical, while cellophane packaged dates have only a two or three month shelf life.

Under the new process, Sunnipalms Date Gardens uses enamel-lined cans. The air in the cans is replaced with nitrogen, and water is added to maintain liquid content. The cans are pasteurized at about 190 degrees, then cooled at room temperature.

Brown Sugar Protection

The problem of retaining soft texture in consumer-packaged brown sugar under adverse atmospheric conditions, has been met by California and Hawaiian Sugar Refining Corp. with waxed glassine papers which have proven effective in insuring "non-caking" brown sugars.

The new material protects the sugar twice as long as the waxed paper formerly used in C and H consumer packages and is used in packaging the firm's Golden Brown and Dark Brown, as well as Dessert (superfine granulated), and Powdered sugars. The new liner material is supplied to

Drink It Or Eat It

Packaged in single portion packets formed from printed stock supplied by Continental Can Co.'s Shellmar-Betner Div., Best-Aid confection is being marketed by Merley Candy Co. Printed in colors to match the individual flavors, the wrapper offers information on the product's dual use as a water-soluble fruit beverage, or as a candy eaten directly from the bag.

C and H by Marathon Corp., Menasha, Wisc. and Western Waxed Paper Co., San Leandro, Calif.

For Package Data Use Reader Service, p. 209

Package & Product Shorts

Beef Bacon
Broken Bow Packing Co., Broken Bow, Nebraska, is producing a "beef" bacon after extensive experimentation.

Tenderizer Addition
Latest entrant in the papaya enzyme meat tenderizer field is Durkee Famous Foods, Cleveland. Packaged in 1-lb. sifter cans, product is said to reduce meat shrinkage.

Ready-Mixes
Aunt Jemima Cake Mix packages for yellow cake mix and gingerbread mix have joined the company's white and devil's food mix. Gingerbread mix requires only water, the others are made with milk.

Outer Foil Wrap
"Junket" Freezing Mix has placed their inner foil lamination on the outside of the package, to form a striking new label design. Blue, yellow and white are used in label print.

Fifth Beef Item
Chopped Beef is the 5th beef item and 28th frozen food item to be marketed by Swift & Co., Chicago. The ready-to-cook meat is packaged in a five color 12-oz. carton.

Small Ham Can
A Three-to-four pound capacity, pear-shaped sanitary ham can has been introduced by Continental Can Co., rounding out their line of ham containers. Container was developed to aid American packers meet competition of foreign ham processors and packagers.

New Dark Brew
Blatz Brewing Co., Milwaukee, has introduced its "Continental Special" dark beer. Bottle is dark green, with full body and long neck.

Padded Shoulders
New Instant Maxwell House coffee jar features higher shoulders and a larger white star on the cap. The mouth of the 6-oz. jar has also been widened for accessibility.

"Start adding chlorophyll to the breakfast food—they want to make our competitors green with envy!"

Whether you have a new concrete floor or are refinishing an old one, the Multi-Clean Method is fast and economical. It fortifies concrete against abrasion and the devastating effects of excessive water, grease, oils, alkali, soaps and other chemicals. It prevents concrete dusting, pitting and chipping . . . gives you a hardened, completely sealed floor in a wide range of permanent non-fading colors and natural. You'll get better service and greater safety with added beauty and longer life from your concrete flooring when you use The Multi-Clean Method.

MULTI-CLEAN cuts hours off maintenance time!

The Multi-Clean Method saves many hours of floor maintenance time. Sweeping is easier, more effective and wet moppings become less frequent. Periodic steel wool buffing loosens stubborn dirt and restores the finish.

IT'S ALL EXPLAINED
Every floor care problem is answered in this 44-page handbook, packed with valuable information about floors and how to maintain them for lasting results and at lower costs.

WRITE TODAY FOR YOUR COPY!

MULTI-CLEAN®
PRODUCTS, INC.
2277 Ford Parkway — St. Paul 1, Minnesota

MAIL COUPON TODAY!

Multi-Clean Products, Inc.
2277 Ford Parkway, Dept. **FE-1**, St. Paul 1, Minnesota

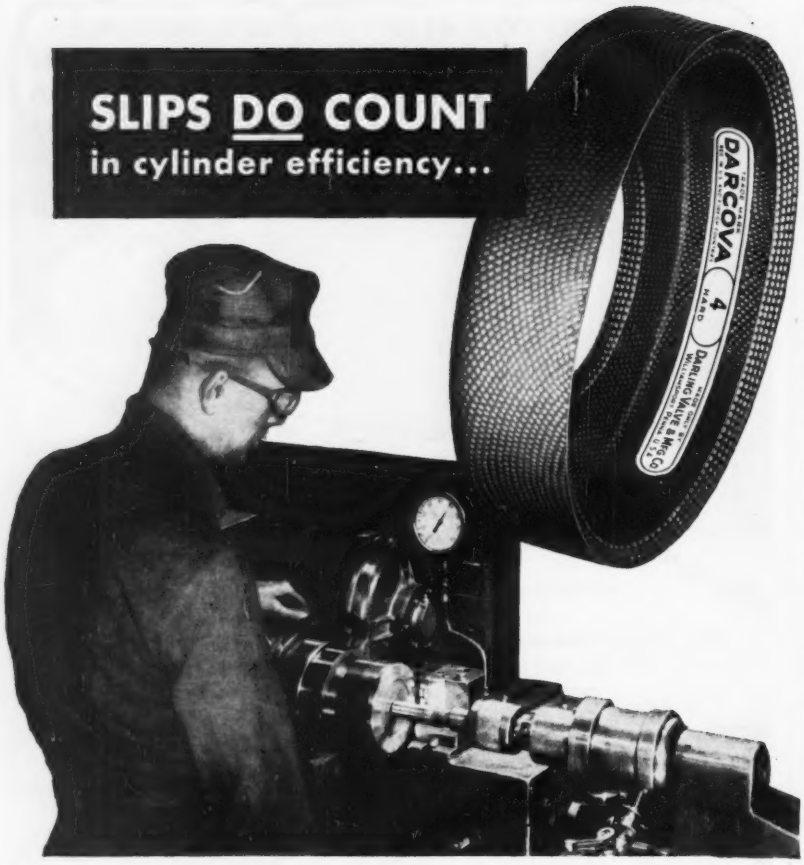
Gentlemen: I would like this handbook and information on: ☐ Floor Machine; ☐ Floor Scrubber; ☐ Vacuum Cleaner. I'm interested in The Multi-Clean Method for: ☐ Concrete Floors; ..... Floors.

Name_____

Address_____

City_____ Zone____ State_____

SEE MULTI-CLEAN IN ACTION — PLANT MAINTENANCE SHOW — BOOTH 1013



Now, cost-conscious engineers are standardizing on **DARCOVA PUMCUPS!**

Reason—On all types of air and hydraulic controls and mechanisms maximum volumetric efficiency is assured with Darcova Pumcups. Moreover, Pumcups outlast ordinary packing at least 3 to 1!

CHECK THESE OTHER ADVANTAGES TOO!

- Reduced operating speeds
- Fewer shutdowns
- Smoother operation
- Lower power costs
- Longer cylinder life
- Closer control

If your slippage is showing, write for Bulletin No. 4502 on Darcova Pumcups for air and hydraulic mechanisms . . . or Bulletin No. 4401 on Pumcups for reciprocating pumps.

DARLING VALVE & MANUFACTURING CO.
Williamsport 20, Pa.

DARCOVA
THE ORIGINAL COMPOSITION CUP
PUMCUPS

Fluidized Dicer

—*Continued from page 50*

into the design of this new machine, called the "Model F" by Urschel. For one thing, it incorporates many sanitary features that eliminate clogging and speed cleanup time.

For example, both stainless steel hopper and discharge spout are made with heli-arc welded joints to eliminate crevices. Also, all vital machine parts of the unit are mounted at its top to greatly facilitate flow-through and maintenance. The discharge spout is only 10 in. lower than feed hopper—a full 30 in. from the floor.

All shields, guards, and spouting on the machine employ snap-on connections and can be removed in a matter of seconds should a jam occur. Also, the knife assemblies are set up for quick change in a matter of a few minutes.

Drive for the new dicer is an enclosed sanitary 2-hp. motor. Main drive bearings are of sealed roller type and are greased from pressure fittings.

While presently set up for only $\frac{3}{8}$-in. cubes, machines incorporating the new principle are expected to be available at later date for $\frac{1}{2}$ -and $\frac{3}{4}$-in. sizes.

End (Resume reading on page 51)

Tabbing Flow

—*Continued from page 40*

electrically. Embedded in its tail is magnetic iron that acts as a variable core in a sealed, sanitary coil assembly below in the pipe (see diagram).

The coils in the pickup transmitter assembly act as two legs of an impedance bridge, with the other two coil legs being in the instrument. The latter thus electronically detects any imbalance of this bridge, with a servo motor driving the pen and circuit to a new balance position with each flow change.

Actual flow range involved is determined by the factory-calibrated weight of the metering float. And sanitation of the meter—which has met health code limits in all dairy installations thus far—can be easily achieved by in-place cleaning techniques.

A recent improvement in the meter was installation of a new oil-immersed flow-totalizing mechanism of very high accuracy. This employs a synchro motor to "sweep" the flow indicating pen every 2.5 sec. Through mechanical linkage, this flow rate is then translated into numerical figures on a regular weight-per-hour digit counter exposed through the instrument case.

End (Resume reading on page 41)

PAINLESS CONVERSION in action at Lee Baking Co. (Campbell Taggart Associated Bakeries, Inc.) Macon, Ga.

KEEP RUNNING FULL BLAST

WHILE DREHMANN REPLACES UNFIT FLOORS WITH MAINTENANCE SAVING SANI-BRICK

Don't let unfit floors play hob with sanitary standards and increase your overhead burden. At the outset of breakdown call upon Drehmann for PAINLESS CONVERSION to long-life, trouble-free Sani-Brick.

Thanks to PAINLESS CONVERSION—a highly successful installation method developed by Drehmann—this work can be done without shut down or slow down. Indeed, you can operate at capacity while Drehmann lays sparkling new Sani-Brick right over your old worn floors.

Time tested performance has proven Drehmann Sani-Brick the ideal food plant floor. No floor of any other type can touch Sani-Brick for architectural beauty, high sanitary properties and low cost maintenance. Likewise unmatched is the ability of Sani-Brick to withstand high impact, abrasion, constant moisture and corrosives.

If any of your floors show signs of cracking, pitting or rotting, call in a Drehmann engineer for corrective action—fast.

DREHMANN PAVING & FLOORING CO.

Originator of Brick Floors—Est. 1869

GAUL & TIOGA STREETS
PHILADELPHIA 34, PA.

5737 S. HALSTED STREET
CHICAGO 21, ILL.

3757 WILSHIRE BOULEVARD
LOS ANGELES 5, CAL.

5121 N. 32nd PLACE
PHOENIX, ARIZ.

DREHMANN HAS THE FLOOR FOR MODERN INDUSTRY

DREHMANN

—SANI-BRICK FLOORS—

For more information, use coupon on page 209.

—*to promote better health*

TO promote better health, mere enactment of laws is insufficient. Experience has shown that effective education of the public in nutritional matters depends to a great extent on the dissemination of the principles of nutrition, food values and related subjects. If the public is properly educated, it will naturally prefer the *improved* staple foods over those which are lacking in good nutritional value.

THE practice of enriching or fortifying foods for better health is becoming more widespread. For example, enrichment of many cereal foods, the fortification of certain fruit and vegetable juices, and of margarine, are accomplished facts in the United States. The list lengthens because food processors know that, fundamentally, the most important factor in foods is nutritive value. So they are making their good foods better—to the benefit of millions of people.

THE firm of Hoffmann-La Roche has for many years pioneered in the production of vitamins for the food and other industries throughout the world. These vitamins, synthesized by chemists, are identical with those existing naturally and are manufactured on a large scale at a much lower cost than if they were extracted from natural sources. These are the vitamins that are used for flour and bread enrichment, the process which to a great extent restores important nutritional values which are unavoidably lost in the milling and processing of wheat when fine, white flour is produced. Rice, corn and other cereal grains are similarly restored and fortified.

ROCHE has experts in many fields and is now offering their experience to you. You are cordially invited to discuss enrichment with us.

ROCHE

HOFFMANN-LA ROCHE INC.
VITAMIN DIVISION
Nutley 10, New Jersey

ADVANCES IN TECHNOLOGY

Chemical Changes in Minor Whey Proteins Responsible for Activated Flavor in Milk

Light from either natural or artificial sources causes chemical changes in a minor whey protein constituent of milk that give rise to an off-flavor which is commonly described as activated.

Homogenized milk is more susceptible to this defect than the unhomogenized product, probably because of the increased area of protein surface adsorbed on the fat globules.

The off-flavor may be detected in milk in clear bottles after exposure to sunlight for as little as 10 min. However, prolonged exposure tends to decrease intensity of the flavor. Methods of retarding development of the flavor include exclusion of air, addition of synergists and antioxidants such as ascorbic acid and NDGA, packaging in ruby or amber glass or paper containers.

There is no correlation between heat treatment, salt balance, breed, fat content, or stage of lactation and susceptibility of milk to activated flavor development. However, the flavor develops more readily in milk from cows on dry feed than from those on green feed, and milk from some cows seems to be more susceptible than that from others.

Irradiation to produce 135-400 USP units vitamin D per qt. does not cause appreciable loss of photosensitive vitamins. But prolonged exposure to natural or artificial light may cause destruction of carotene, vitamins A and D, thiamin, riboflavin, pyridoxine, ascorbic acid and tocopherol.

Article is a review of literature containing 105 references on this specific subject.

Digest from "The Effect of Light on Activated Flavor Development and on the Constituents of Milk and its Products: A Review," by J. W. Stull, *Journal of Dairy Science*, 1153-64, Nov. 1953.

Frozen Confections

Recently patented is a device for molding ice cream in conical shape with a hollow conical recess therein to receive syrup or crushed fruit to produce a sundae type of frozen confection.

Device is a wire rack supporting a horizontal series of wire loops adapted to receive cups or containers of conical shape, made of an impervious material such as paraffin paper. A tray member carries hollow conical projections adapted to be lowered into the conical containers, thereby forming a recess in the molded confection.

In operation, containers are placed in their supporting wire loops, and a predetermined quantity of ice cream (sufficient to fill them when the conical projections are lowered) is poured in. Device is then placed in an air blast or other suitable freezing medium to harden the confection. When this is accomplished tray member is raised. Frost bond between confection and conical projections lifts containers out of supporting loops.

Warm water is then circulated through tray and hollow portions of projections to break frost bond and allow confections and containers to fall back into their supporting loops. Containers and frozen confection are now ready to be packed for storage or shipment.

For personal service the container may be stripped from the confection, and the latter served in an edible cone, with the desired syrup or crushed fruit in the recess.

Digest from U. S. Patent 2,649,057, issued Aug. 18, 1953, on an application dated July 31, 1947, to Clarence R. Niklason, Arlington Co., Va.

Insecticides From Hay Carry Through In Milk

When daily intake by cows is below 0.5 mg. per kg. of body weight of either toxaphene or chlordane no measurable quantities of these insecticides are excreted in the milk.

However, toxaphene intake of 1.4 mg. does result in detectable quantities, and, at a 9 mg. level 3-4 ppm. is eliminated in milk. Chlordane fed at 9 mg. gives 7-8 ppm. in milk.

These results were obtained in studies on milking cows fed alfalfa hay that had been sprayed under normal field conditions with: (1) toxaphene emulsion 1½ lb. per acre followed by chlordane emulsion 1 lb. per acre, and (2) toxaphene, 1½ lb. per acre and chlordane 2 lb. per acre. Following hay feeding tests, the same cows were fed technical grades of toxaphene and chlordane in soybean oil at levels up to 10 mg. per kg. body weight.

After tests were discontinued for 30 days. no further traces of insecticides were found.

Digest from "The Toxaphene and Chlordane Content of Milk From Cows Receiving These Materials in Their Feed," by R. H. Carter, P. E. Hubanks, F. W. Poos, L. A. Moore and R. F. Ely, *Journal of Dairy Science*, 1172-77, No. 1953.

BAKING

Proper Heating of Puddings Kills Pathogens In Mix

Danger of food poisoning from use of contaminated eggs in puddings and custards is remote if adequate heat is applied during preparation, followed by refrigeration.

This conclusion is based on experiments with vanilla, butterscotch, chocolate puddings, and baked custards containing dried eggs to which

INDEX TO ABSTRACTS

DAIRY
Chemical Changes Cause Flavor 193
Frozen Confections 193
Insecticides in Milk..... 193
BAKING
Proper Heating Kills Pathogens.. 193
SANITATION
Disposal of Dairy Waste..... 194
CEREAL PRODUCTS
Color Changes in Macaroni.... 194
FERMENTATION
Propagating Bakers' Yeast..... 195
DEHYDRATION
Drying Papaya Mix..... 196
FATS & OILS
Phases of Cocoa Fat..... 196
FRUITS & VEGETABLES
Canned Banana Puree..... 198
Dehydrated Pineapple Juice.... 198
CONFECTIONERY
Improved Candy Center Machine 199
MISCELLANEOUS
Liquid Food Sterilizer..... 199
Acidity of Beers..... 200

broth-bacteria cultures (7 species of Salmonalla, 1 food poisoning strain of Staphylococcus) were added during reconstitution.

Temperatures of 172-188 F. did not destroy all bacteria, but greatly reduced their numbers and inhibited growth for at least 3-hr. at room temperature. Prompt refrigeration prevented further growth for 24-hr.

Heating to 197-200 F. destroyed all pathogenic bacteria present.

Digest from "Survival of Staphylococcus and Salmonellae in Puddings and Custards Prepared With Experimentally Inoculated Dried Eggs," by T. C. Kintner and M. Mangel, *Food Research*, 492-96, Sept.-Oct. 1953.

SANITATION

Disposal of Dairy Wastes

Milk plant wastes of low solids content can be stabilized by aeration in the presence of suitable microorganisms, preferably those found in sludge from such aerated wastes.

Known organisms, such as *Bacillus polymyxa* or *Saccharomyces fragilis* will reduce oxygen demand of wastes to a high degree, but there is little justification for use of pure cultures on valueless waste. Sludge organisms act rapidly and, in experiments on synthetic dairy waste (0.1% dry skim milk solution), 62.5% of chemical oxygen demand (COD) was converted into cell substance. Remainder was used for energy.

Hourly oxygen requirements are greatest during cell-growth phase—0.075 lb./lb. skim milk solids/1,000 lb. water/hr. for 6 hr. Continual aeration brings autodigestion of cells by endogenous respiration and requires a lesser hourly rate of oxygen usage—0.005 lb./hr.—but digestion requires about 160 hr.

A plant using these principles has been developed and proposed for disposal of wastes in a small dairy. In use it would maintain a balance, producing no excess sludge, and an effluent essentially free of organic matter.

Digest from "Aerobic Treatment of Dairy Wastes" by N. Porges, L. Jasewicz, and Sam R. Hoover, *Journal of Applied Microbiology*, 262-70. Sept. 1953.

CEREAL PRODUCTS

Color Changes In Macaroni

Deepening of color in pressed macaroni during oven drying is related to formation of reducing compounds between amino acids and carbohydrates.

This was determined in the course of a study made to ascertain basic causes of darkening of pressed macaroni. Semolina (from composite of

"We increased storage capacity one-third, cut car-unloading time by more than 50% with Clark Trucks," SAYS JOSEPH PALESE,

PLANT SUPERINTENDENT, SALERNO-MEGOWEN BISCUIT CO., CHICAGO.

In this Salerno bakery, one of the world's largest, you find four Clark electric fork trucks and three Clark Powrworker hand trucks—unloading and storing raw materials and handling palletized cartons ready for shipment.

Practically all material received from local suppliers—bags of flour and sugar, drums of oil and shortening, other items in boxes, sacks, rolls—is loaded on pallets manufactured by Salerno, and furnished by them to suppliers. The busy Clarks take over at the receiving doors, and handle materials throughout the full production cycle. Benefits are substantial: a 33% increase in storage capacity and car-unloading time cut by well over 50 per cent.

"We are completely satisfied with our Clark machines, and have three more on order," says Mr. Palese.

These benefits can be yours—simply call your local Clark dealer, listed in the Yellow Pages of your phone book: a good man to help engineer a handling system to meet your needs.

CLARK EQUIPMENT

Industrial Truck Division
CLARK EQUIPMENT COMPANY
BATTLE CREEK 14, MICHIGAN

durum wheats grown at 6 locations in North Dakota) was made into dough, then formed into disks by application of 0, 1,000, 2,000, 3,000, 4,000, 5,000, 6,000 psi. pressure. Disks were oven-dried for 1-hr. at 266 F., then air-dried for 48 hr. Various products were added to the dough to determine their effects.

Reducing values of dried disks doubled with increasing pressure up to 3,000 psi., then remained constant. Light absorption values increased similarly. Amino groups increased 38% at 1,000 and 2,000 psi., 26% at 3,000 and 6,000 psi.

Heating at 266 F. caused formation of characteristic brown color in pressed disks. Depth of color was directly related to pressure below 3,000 psi. Drying at lower temperatures decreased color formation. Heat alone failed to induce browning.

Acetaldehyde increased formation of reducing groups and light absorption after an initial decrease at 0.3% aldehyde. Sucrose had little if any effect. Sodium bisulfiite increased slightly the number of reducing groups and light absorption. Cysteine hydrochloride and glucose showed a marked increase in reducing groups, demonstrating that the amino acid and carbohydrate were the principal reactants.

Digest from "Observations on Reducing Groups and Color Changes in Macaroni Dises," by O. J. Banasik and R. H. Harris, *Food Research*, 480-91, Sept.-Oct. 1953.

FERMENTATION

Propagating Bakers' Yeast

Oxygen uptake by microorganisms in aerated submerged culture is of primary importance in compressed yeast manufacture as well as in antibiotic and other industrial fermentations.

Aeration rates in a laboratory fermentor (1½ l. operating capacity) were established by first measuring oxygen uptake in aqueous sodium sulfite solutions during aeration and agitation. Studies were then made on bakers' yeast, using synthetic glucose-salts-asparagine medium, fortified with nutrilites and trace elements.

In batch fermentations there was a clear indication of simultaneous glucose assimilation and ethanol formation, followed by utilization of the ethanol for yeast cell formation. In continuous fermentations there is a critical rate of glucose feed input for maximum yeast yield. Below 3.5 millimols of glucose per hour per g. of yeast, excessive CO_2 is formed; above this rate there is excessive glycolysis of glucose to ethanol.

another **BECKMAN** *achievement!*

...now better moisture measurements with the BECKMAN

AQUAMETER

Anybody who can read a burette and flip a switch can make fast, accurate moisture analyses with the BECKMAN AQUAMETER. The Aquameter uses the Karl Fischer method – most universally applicable for moisture determinations. And it does these Karl Fischer titrations AUTOMATICALLY, eliminating the problem of judging subtle end-point color changes which formerly required skilled technicians.

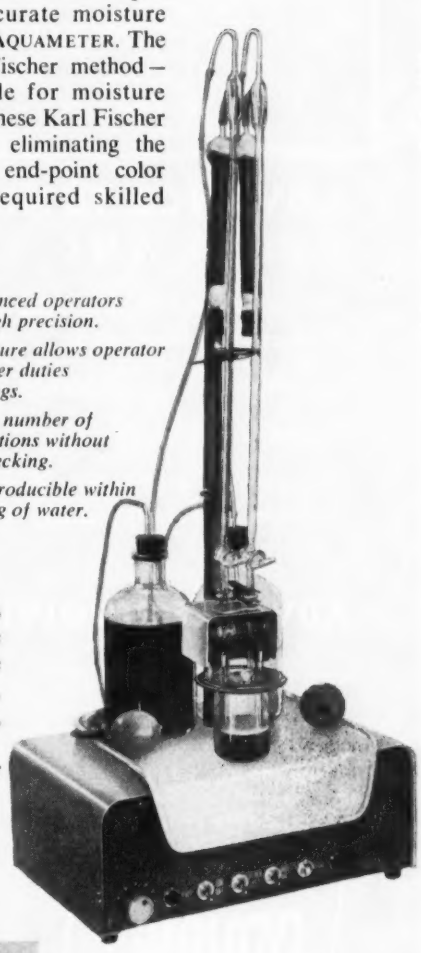
...other advantages

Even inexperienced operators can achieve high precision.

Automatic feature allows operator to perform other duties between readings.

Completes any number of sequential titrations without resetting or checking.

Results are reproducible within a few tenths mg of water.



The Beckman Aquameter is ideal for routine moisture determinations on a wide variety of food products, including coffee, flour, grains, yeasts, syrups and jellies.

For full details, see your Beckman Dealer or –

Write for Data File 45F– 18

Beckman *division*

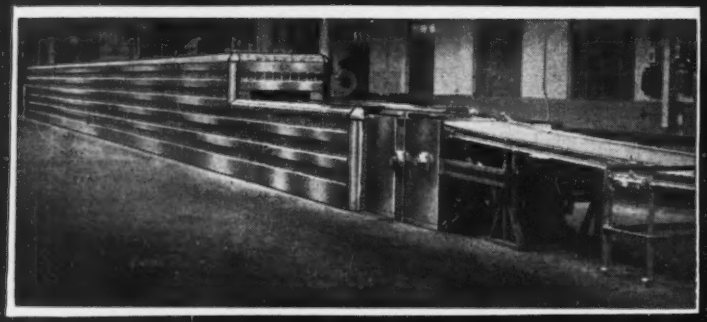
BECKMAN INSTRUMENTS, INC.
SOUTH PASADENA 1, CALIFORNIA

ADVANCE

OVENS & CONVEYERS

for BAKING • TOASTING • HEATING
• DRYING • STERILIZING

Approved by Users from Coast to Coast



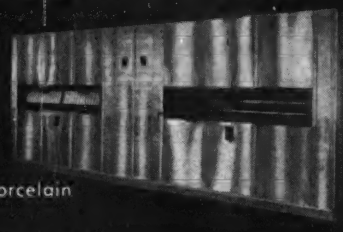
✓ADVANCE TUNNEL OVENS AND CONVEYERS...

with Advance-designed features that mean increased production at lower cost:

- Controlled Top and Bottom Recirculated Heat.
- Direct or Indirect Firing (Oil, Gas or Electricity).
- Conveyers of Swedish steel or wire mesh band. Chain and roller drive. Electronic self-aligning design.

✓ADVANCE REVOLVING OVENS . . .

Uniform, dependable production. Available in 12 sizes. All steel and aluminum construction with drop-type doors, safety pilots, electric ignition. Choice of stainless steel, porcelain or aluminum exteriors.



ADVANCE

WRITE for complete information

OVEN COMPANY

700 So. 18th Street, St. Louis 3, Missouri

Manufactured in Canada by Fort Engineering & Sales Ltd., Montreal

Yeast yield increases with aeration until the glucose feed rate is no longer optimum, then decreases. Aeration is the primary limitation on production capacity for a fermentor, since, when fed at the optimum rate, maximum cell population is reached when oxygen transfer reaches its limiting value.

Digest from "Aeration Studies on Propagation of Baker's Yeast," by W. D. Maxon and M. J. Johnson, *Industrial & Engineering Chemistry*, 2554-60, Nov. 1953.

DEHYDRATION

Dried Papaya Mix

Production of a dried papaya fruit-milk for addition to ice cream, milk or other dairy products to form a novel, pleasant tasting beverage that is healthful and aids digestion is the object of a recent invention.

Preparation of the product comprises washing, peeling, cutting into sections, and removing seeds from ripe papaya melons. Sections are then chopped into very fine particles and sugar, flavor, essential oils, and food acids added.

Mixture is heated to 105 F. for 2-hr., then raised to 140 F. for 1-1½ hr., and finally to 158 F. for ½-1 hr. Latter two steps may be combined and the mixture heated directly from 105 to 158 F. where it is held 2-hr. Temperature is then raised to the boiling point and the mixture poured into pressing bags or wine presses. In some cases the above mentioned flavors are added to the strained juice at this point instead of earlier.

Juice is concentrated to 30 Bé under vacuum and vacuum-drum dried. Then papain (60-110 ppm.) is added with mixing. Papaya-papain product is mixed with powdered milk in a ratio of 2-1, the mixture canned and sealed.

Digest from U. S. Patent 2,650,165, issued Aug. 25, 1953, on an application dated May 31, 1950, to A. S. Wahl, Chicago.

FATS & OILS

Phases of Cocoa Fat

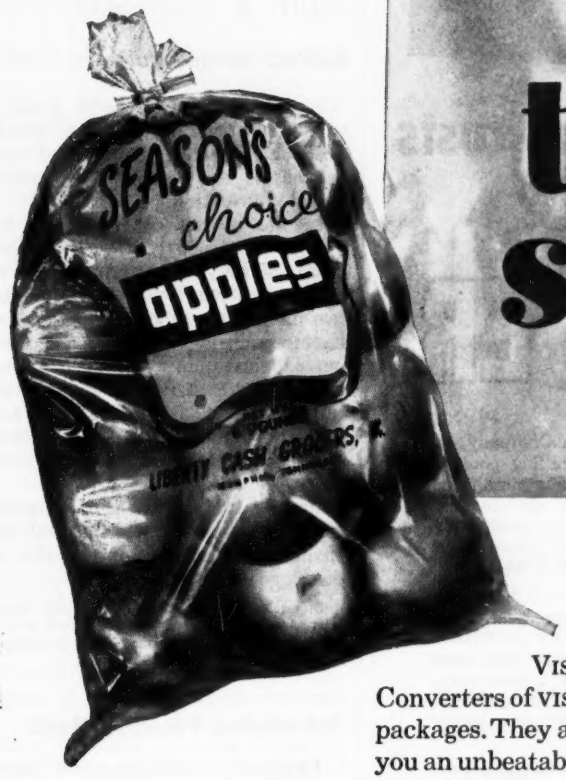
By using a counting tube type X-ray diffraction goniometer, characteristic intensity-diffraction-angle curves can be obtained for the cacao fat phases, α, β, and β_1. The unstable γ phase has not been successfully characterized by this method and there seems to be some doubt of its actual existence.

Fat-free cocoa powder gives a baseline curve without peaks. Sucrose, a common ingredient of chocolate mixtures, has a very complex curve by this method, but it can be removed from chocolate by solution in water, after

bags made of

VISQUEEN "C"

do a selling job for you because . . .



VISQUEEN "C" costs no more than films that won't hold ink.

VISQUEEN "C" is your best bet for packaging fruits. Converters of VISQUEEN film are top experts in the design of flexible packages. They are backed by VISKING's superior know-how to offer you an unbeatable combination. The coupon will bring you this help.

VisQueen® film . . . a product of

THE VISKING CORPORATION

World's largest producers of polyethylene sheeting and tubing

Plastics Division, Terre Haute, Indiana

In Canada: Visking Limited; Lindsay, Ontario

Important: VISQUEEN film is all polyethylene, but not all polyethylene is VISQUEEN. VISQUEEN film is produced by process of U.S. Patents No. 2461975 and 2632206. Only VISQUEEN has the benefit of research and technical experience of The Visking Corporation, pioneers in the development of pure polyethylene film.

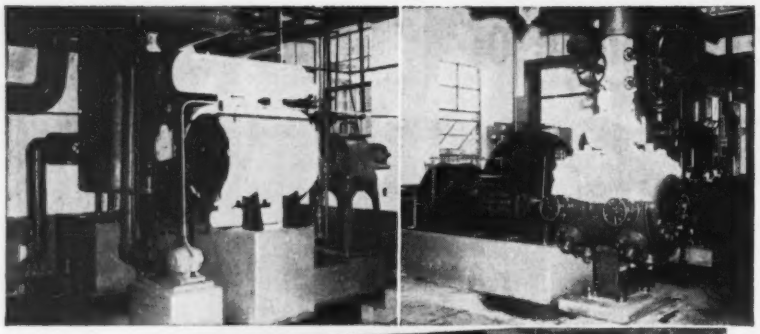
THE VISKING CORPORATION, BOX RI-1410, Plastics Division, Terre Haute, Indiana

Send me names of VISQUEEN converters serving my area.

Name_____ Company_____

Address_____ City_____ Zone____ State_____

For more information, use coupon on page 209.



Swanson

Want to cut poultry chilling costs as C. A. Swanson did?

CHECK with VILTER

After trying many different processes, the C. A. Swanson Company, in their Salisbury, Maryland branch, found a method of chilling poultry quickly and efficiently. Here Swanson's have cut the chilling time from two hours to 25 minutes! The savings in production costs are obvious. Moreover, Swanson has eliminated the labor costs formerly needed for crushing and handling ice, and has ended the loss of up to 15% in crushing ice. To top it all off, Swanson's new equipment requires much less attention, far less maintenance.

A 30-ton Vilter PakIcer did all of this for C. A. Swanson. A 90 GPM pump circulates this amount of water to the PakIcer where a proportion is frozen into ice. This 32° ice and water mixture flows to the chilling vats; thus, the only labor required is to direct the flow into the desired vats. The Vilter PakIcer has cut operating costs, in addition to the enormous advantages in this new chilling method. Naturally, Vilter compressor equipment is also in operation in the Swanson plant.

This installation is another example of the help that Vilter equipment and Vilter engineering provide for industry. Time after time, Vilter installations have brought about substantial reductions in production costs, and have provided more dependable cooling, with lower operating and maintenance costs at the same time. If you depend on refrigeration or air conditioning, check with Vilter. You're bound to gain!

Vilter®

Your nearby Vilter Representative or Distributor will be glad to show you how Vilter refrigeration and air conditioning can help you. Remember, Vilter *knows* food processing.

REFRIGERATION and AIR CONDITIONING

THE VILTER MANUFACTURING COMPANY, MILWAUKEE 7, WIS.

Air Conditioning • Ammonia & Freon Compressors • Booster Compressors • Baudelot Coolers • Double Pipe Coolers • Blast Freezers • Evaporative & Shell & Tube Condensers • Pakicers • Pipe Coils • Valves & Fittings

which the curves for cacao fat are obtainable, and its phase determined.

Chocolate up to 6 months or so after molding maintains the β_1 form, but in time or at temperatures of 90 F. or higher it assumes the stable β form. The fat shows the curve of a non-stable fat and changes to stable forms quite slowly even at 90 deg.

Non-cacao fats also show characteristic diffraction angle curves when examined with the X-ray goniometer. Hardened peanut oil, often used with cocoa butter, and hard to detect in it chemically, can be detected with certainty by this method.

Digest from "The Phase Conditions of Cacao Fats," by C. Keil and A. Hettich, *International Chocolate Review*, Vol. 8, No. 10, 265-70, Oct. 1953. (In German)

FRUITS & VEGETABLES

Canned Banana Puree

A storable banana food product having substantially the color, flavor, odor and chemical content of ripe bananas is the object of a recently patented invention.

In the process, ripe bananas are peeled, sliced and covered with cane syrup (35 Bé), then exposed to 28-31 in. vacuum for 5 min., followed by two momentary exposures to vacuum. Excess syrup is removed, bananas are pureed, then pumped through a ½-in. tubular heat exchanger where temperature is raised to at least 175 F. and reduced to about 140 F. Product is filled into sterilized, enamel lined cans.

Pressure of 30-60 psi. (to prevent frothing) is maintained in heat exchanger by means of control valve on discharge end.

Digest from U. S. Patent 2,647,838, issued Aug. 4, 1953, on an application dated Feb. 3, 1950, to R. T. Stone, assigned to Food Concentrates, Inc., New York. *

Dehydrating Pineapple Juice

Designed primarily to avoid loss of volatile esters, a recently patented process for concentrating pineapple juice keeps it under refrigeration from the time fruit is peeled until juice is canned.

In the final steps of the process, water is removed by freezing. Equipment used is jacketed for cooling by a refrigerant, and the temperature at all stages is kept between 40 and 0 F.

In operation, pineapples are peeled, then disintegrated and fed to a colloid mill for reduction to colloidal fineness. Discharged product is screened to separate coarser material which discharges as refuse.

Finer particles, including albumin

and esters, pass to a centrifuge in which a separation is made between heavy pulp and juice containing the albumin and esters. Latter is again centrifuged for separation of albumin and esters from juice, which is subjected to a step-freezing process in which the differential between successive freezing tanks is 5 deg.

Ice crystals forming in each tank are centrifuged from juice before it is passed to the next freezing tank. After 5th step, albumin and esters are mixed with concentrated juice which is packed in the usual manner.

Digest from U. S. Patent 2,647,059, issued July 28, 1953, on an application dated Sept. 15, 1951, to E. P. Weenzelberger, assigned to The Commonwealth Engineering Co. of Ohio, Dayton.

CONFECTIONERY

Improved Candy Center Machine

In a patented candy-making machine of the Mogul type, the starch-conditioning apparatus, hitherto separate and apart from the unit is incorporated therein with obvious convenience, and economy in floor space and operation.

In the combined machines, mold trays are filled with starch and conveyed to an imprinter which forms depressions or recesses. Trays then move to a depositor where mold recesses are filled with confection.

When candy hardens trays are successively conveyed to a device where contents are dumped onto a screen for separation of starch and candy. Latter is brushed free from adhering starch and conveyed away as a finished product.

Starch is conveyed through a series of spiral screws in which it is broken down into powder form. It is further conditioned by heating with banks of infra-red lamps placed above the conveyors. Conditioned starch then goes to a chamber for re-use in the tray-filling operation. Suction means are provided at each station to collect the starch dust and convey it to a cyclone.

Digest from U. S. Patent 2,648,295, issued Aug. 11, 1953, on an application dated July 29, 1950, to Joseph Greenberg, New Rochelle, and George S. Perkins, New York, assigned to National Equipment Corp., New York.

MISCELLANEOUS

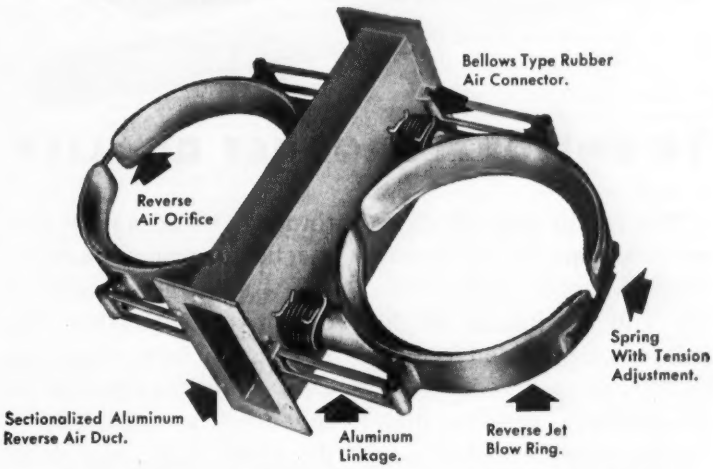
Liquid Foods Sterilized By Improved Unit

Direct steam-heating of liquid foods as means of sterilization, pasteurization, or enzyme inactivation, is the basis of a patented process.

In brief the system involves mixing

To manufacturers who have dust problems...this announcement is of the utmost importance.

DAY Type "AC" (reverse jet) Dust Filters are now being furnished with SELF-ADJUSTING BLOW RINGS, made under DAY and Hersey patents. This DAY improvement, to an already efficient dust filter, is now offered to industry after months of study and operation.



Wool felt and probably any other material with similar efficient filtering characteristics is inherently dimensionally unstable. DAY'S SELF-ADJUSTING BLOW RINGS automatically compensate for any variation in the filter tubes due to changes in temperatures, pressures, moisture conditions, etc. They assure perfect ring to cloth contact.

If you have a dust problem write toDAY for Bulletin 528-R.

The DAY Company
817-3rd Avenue N.E. • Minneapolis 13, Minnesota
IN CANADA: P. O. Box 70D, Ft. William, Ont.
Branch Plants in Buffalo, Ft. Worth and Welland, Ont.

DAY SINCE 1881 DUST CONTROL
A SINGLE UNIT OR A COMPLETE SYSTEM

"magic carpet"

TO UNIFORM PRODUCT QUALITY

The results may not show on your package label, but W&T Merchen Scale Feeders with continuous weigh-belt for weighing and feeding in one operation — can help to maintain uniform high quality in final product.

Precision scaled, durably constructed and simply controlled, W&T Merchen Scale Feeders deliver minute to minute accuracy whether feeding only a few or many thousands of pounds per hour. In modern food processing operations — premixing, batching and continuous blending — this exacting accuracy is a requisite. As further assurance of uniform quality, the Feeder may be synchronized with other equipment to shut-down automatically in the event of any equipment or supply failure.

If you have a food processing problem requiring uniform feeding and control — automatically by weight — communicate today with Wallace & Tiernan. Your inquiry will receive prompt attention without obligation.

M-22

WALLACE & TIERNAN
COMPANY, INC.
NEWARK 1, NEW JERSEY • REPRESENTED IN PRINCIPAL CITIES

the liquid with steam whereby the foodstuff is almost instantaneously brought to desired temperature. Hot mixture is then discharged, after brief retention time, into an evaporation zone wherein the foodstuff is cooled and at the same time the water derived from the added steam is evaporated.

Steam injector unit in which mixing is accomplished is of small dimensions—5.0 cu. in. or less per 100 gal. per hr. of processing capacity. By simple adjustment of the steam pressure at the heater and the degree of vacuum applied at the cooling step, the system can be changed and made suitable for sterilization, pasteurization, or partial concentration. Vapor evolved in the cooling step may be condensed and returned to the finished product if desired.

As an example, fresh orange juice was processed at the rate of 25-30 gal. per hr. Temperature in mixing chamber was 210 F.; in separator, 76-78 F. Total elapsed time for each particle of juice to be heated from room temperature to 210 and then cooled to 76-78 F. was 1.5 sec.

Digest from U. S. Patent 2,636,430, issued Apr. 28, 1953, on an application dated June 14, 1950, to A. H. Brown, El Cerrito, P. W. Kilpatrick, Albany, and M. E. Lazar, Oakland, Calif., assigned to the United States of America as represented by the Secretary of Agriculture.

Acidity of Beers

Accurate pH measurements can be obtained on brewery products containing SO_2 by use of glass electrodes, but not with a hydrogen- or quinhydrone-electrodes.

A beer (freed of SO_2) that had a pH of 4.65 with each of the 3 electrodes, had indicated pH's of 4.67, 4.63, 4.59, with hydrogen, quinhydrone, and glass electrode systems when 10 ppm. SO_2 were added. At 20 ppm. SO_2, hydrogen electrode measurements was very uncertain at 4.62, quinhydrone 4.60, and glass 4.56. With 30 ppm., hydrogen electrode was no longer usable; the quinhydrone one still showed a pH of 4.60, while the glass electrode indicated 4.54.

Hydrogen electrodes are evidently rapidly "poisoned" by SO_2, or by its reduction to H_2S on the platinum surface. The quinhydrone system is affected by the reducing action of SO_2. The glass electrode is not affected by oxidation-reduction effects, by absorption of SO_2, or by CO_2 of the beer. Its indications are therefore a reliable measure of the beer pH while the results of the other electrodes are highly uncertain.

Digest from "Comparative pH-Measurements With the Hydrogen, Quinhydrone, and Glass Electrodes in Sulfur Dioxide Containing Liquids," by E. Paukner, *Brauwelt*, 924-26, Sept. 11, 1953.

Suppose we put the Dempster-Dumpster System right down in your plant . . . then what?

● *Well First—let's make it clear that we are furnishing you with several sizes of different designs of 26 containers to suit your materials requirements. Then bear in mind that we are delivering you only one truck-mounted Dempster-Dumpster and with your driver this one outfit picks-up, hauls and dumps all containers, about like the one shown above.*

Now, how many conventional trucks are you using for handling rubbish, scrap, raw materials, and what have you?

For several years now, one plant has been doing considerably more work with two Dempster-Dumpsters and two men than they did with five trucks and fifteen men before the Dempster-Dumpster System was installed. You can guess at the approximate savings annually.

A glance at the picture below and you get the whole story of the Dempster-Dumpster System. Never before have you been able to cut bulk materials handling costs so drastically.

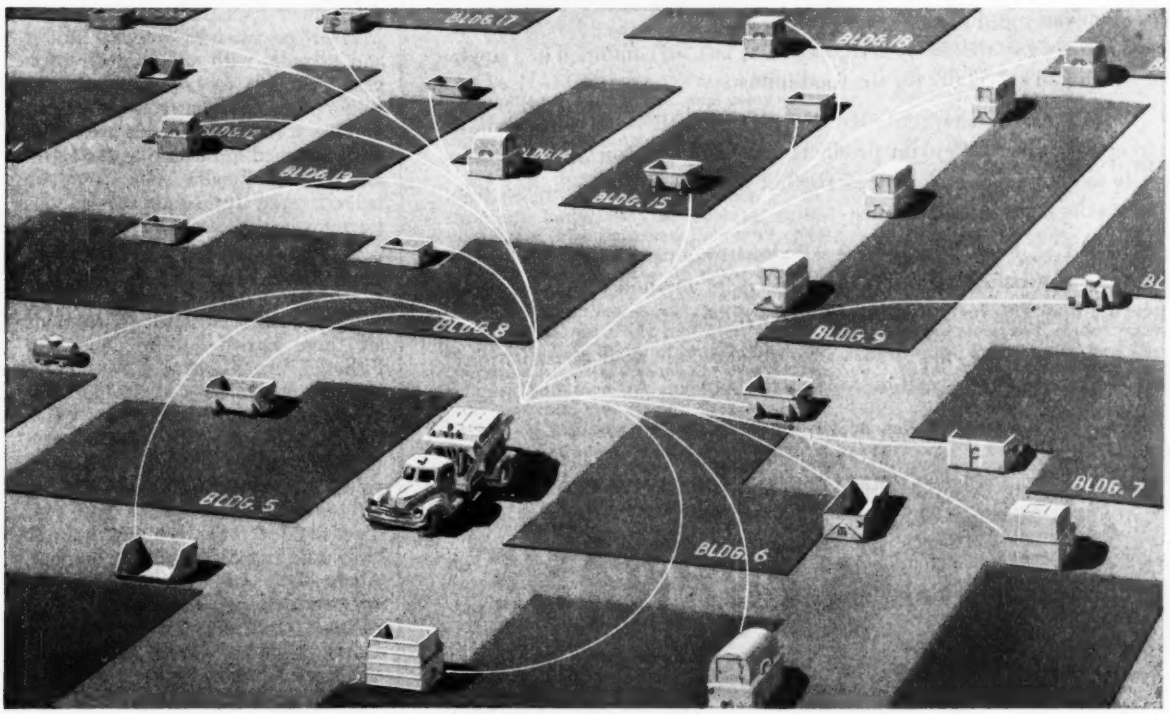
One truck mounted Dempster-Dumpster handles the entire group of 26 Dempster-Dumpster containers. These big, detachable steel containers are like having 26 truck bodies for a single truck.

Any required number of Dempster-Dumpster containers are spotted at convenient materials accumulation points inside and outside your buildings. They range in sizes up to 12 cu. yds.—3 to 4 times the capacity of a regular dump truck. Materials—bulky, light, heavy, solids, rubbish and even liquids—are dumped or placed into these containers.

The truck mounted Dempster-Dumpster makes scheduled rounds, picks up each preloaded container, carries it to the point of disposal, sets it down intact or dumps the materials and returns the container for refilling. The entire operation is hydraulically controlled and handled by your truck driver.

It's as simple as we have described it. The amazing thing is the tremendous savings being made by the Dempster-Dumpster System in hundreds of leading industrial plants over the nation.

A product of Dempster Brothers, Inc.



DEMPSTER BROTHERS, 714 Shea Bldg., Knoxville 17, Tennessee

Cross-section shows FURNANE Food Plant Floor on concrete slab with membrane. Installation shown is in meat packing plant.

AT LAST... the realistic solution to food plant floor protection

NOW you can put an end to floor troubles . . . and recurring floor costs. You can put down a floor to stay. Lasting beauty . . . long service . . . and assured installation techniques are, at last, all combined in a single floor developed especially for the food industry.

ATLAS FURNANE® FOOD PLANT FLOORS resist the whole range of corrosive food plant products and residues. Not only are they inert to acids, sugars and biologicals, but they also resist alkalies, oils, greases, salts and cleaning agents.

FURNANE Food Plant Floors are also strong physically. They may be installed by either tilesetters' or bricklayers' methods. A clean, smart appearing floor results . . . with flush and solid joints.

Why continue to pour money into questionable floor construction? Write for complete information today.

New Booklet Available. Send for Bulletin 3-2

ATLAS MINERAL PRODUCTS COMPANY
MERTZTOWN, PENNSYLVANIA
Houston 1, Texas

ATLAS FURNANE®
FOOD PLANT FLOORS
...the realistic solution to food floor protection.

® U. S. Pat. Office 553217

Fish Sticks

—Continued from page 44

cut by a rotating knife, were frozen.

In most cases, processing of fish sticks is carried out batch-wise. As consumer acceptance mounts and more processors climb on the bandwagon, operations undoubtedly will be mechanized and become continuous.

Making the Sticks

Currently, operations that may be performed continuously and in a straight-through manner are battering, breading, deep-fat frying, and cooling. Needed, however, is a continuous method of forming, cutting, and freezing the fish sticks.

At present, most processors are freeze-molding the fish fillets into blocks, which are then cut to size with the aid of a band saw. Perhaps it is not amiss to suggest looking into the use of a sausage stuffer for this purpose?

Here's how the process might then be carried out:

Cut fillets into pieces by feeding them onto a conveyor consisting of longitudinally-arranged rubber or Neoprene strips ($\frac{1}{4}$ to 1 in. wide) spaced sufficiently apart to permit a series of circular knives to rotate between them. Size of fillet pieces to be extended through the stuffer will have to be determined by experiments.

Load pieces into sausage stuffer and extrude, with sufficient air pressure, through a $\frac{3}{4}$x$\frac{3}{4}$-in. nozzle, or stuffing horn. Cutting to 3-in. lengths may be accomplished with a rotating knife attached to the end of the extrusion nozzle. Finally, sticks could be belt-conveyed through a continuous freezer.

Cape Ann's Way

Typical of the fish-stick operations are those carried out by Cape Ann Fisheries, Inc., Gloucester, Mass.

Here, fish fillets—cod, haddock, or ocean perch—are molded by quick freezing in stainless steel trays ($\frac{3}{8}$x10x36 in.). Frozen, molded fillets are then removed from trays and cut into $\frac{3}{8}$x$\frac{3}{8}$x3-in. sticks with a band saw. Two molded forms are sawed simultaneously to speed cutting operations. About 30 lb. of sticks are placed on trays, which are then loaded onto mobile racks. Sticks are either held in freezer storage or directly pushed into the breading-frying department.

Now for a step-by-step account of the breading operations:

Sticks are dumped from trays into a compartment adjacent to a stainless

steel battering table (½x2½x6 ft.). From the holding bin, two girls take 5-lb. lots of sticks and each immerses them into a 10-lb. capacity stainless steel bowl, which contains an all-purpose egg batter. Employed is a dry batter mix, which is reconstituted with the required amount of water. Mix ingredients consist of cereals, powdered whole eggs, non-fat dried milk, salt, and spices.

After the sticks are swished around in the batter, they are transferred to wire-mesh trays for draining. Trays are then tilted so that the battered sticks drop onto a breading mixture. This mixture contains toasted wheat, wheat flour, corn flour, salt, and spices.

Samples of all incoming shipments of egg batter and breading mixes are constantly checked by Cape Ann for possible presence of foreign matter.

After the sticks are completed breaded, they are placed on wire-mesh trays. Each tray holds 72 sticks and is moved to two batch fryers, which are alternately operated by one man.

Trays are immersed in 375-deg.-F. shortening and fried for 2½ min. Trays of fried sticks are transferred to a stainless steel, inclined table for a 2-min. draining of excess cooking fat.

Twice daily, the shortening is clarified in a pressure-type filter. At the end of each day's production, fryers are emptied and thoroughly cleaned.

Cooling of the fried sticks comes next. Trays of sticks are loaded into a cabinet-type cooler that is equipped with an 18-in.-dia. floor fan. Capacity of the cooler is 24 trays, and cooling takes about 5 min.

Girls now pack ten 1-oz. fish sticks in cartons lined with greaseproof glassine or cellophane. Cartons are check-weighed and loaded onto freezer trays. After quick freezing, cartons are machine-overwrapped with printed waxed paper, and then cased.

End (Resume reading on page 45)

Truck Refrigeration

—Continued from page 48

larger ring gear on the shaft of the hydraulic clutch.

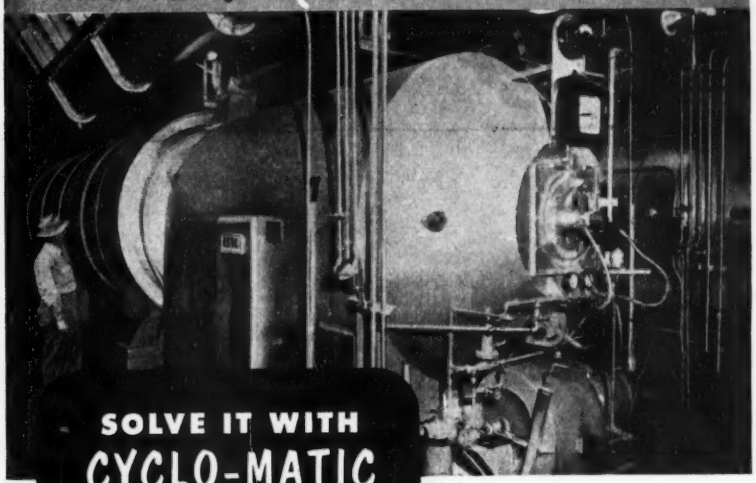
In both cases, the ring gear is connected with four steel driving plates. Attached by clutch case bolts, these plates rotate with the drive shaft.

Alternating between these four plates are three driven plates of bronze conecting by splines to the refrigerator compressor shaft. The latter plates rotate only when oil pressure forces a contact between them and the drive.

In this system, hydraulic fluid is forced by an oil pump from a self-contained reservoir into the chamber containing the plates and against the

WHAT'S YOUR DEHYDRATING PROBLEM?

Cost? Product Quality? Space Limitations? Vitamin Loss? Uniform Color and Dryness? Fuel Consumption? Installation?



SOLVE IT WITH CYCLO-MATIC DRYING

FOUND ONLY IN ARDRIER DEHYDRATORS

CYCLO-MATIC Drying solves the dehydrating problems listed above, and many more, by its efficient application of the "flash" drying principle and simple 3-pass drum design, an exclusive Heil feature.

The three drums of the dryer are arranged concentrically, one within the other, all mechanically interlocked and rotating at the same speed. Material enters the center cylinder at the burner end. As it progresses, it is repeatedly carried to the top of the cylinders by built-in flights and showered through the drying medium. Rapid moisture evaporation keeps material relatively cool (130°-155° F.) as the drying fan draws it through the center cylinder, then back through the intermediate cylinder, and forward again through the outer cylinder. Velocity and heat of the air stream are different in each of the three drums to meet changing rates of evaporation. Maximum exposure of all particles to the heated air in a "flash" of time assures maximum retention of all vitamins and nutrients in the material.

Find out about the many other features that help you increase product quality at lower cost. Send the coupon for bulletins.

ARDRIER DEHYDRATORS are manufactured for ARNOLD DRYER COMPANY by THE HEIL CO.

HIGHEST QUALITY OUTPUT FOR

- Apple Pomace
- Beet Pulp
- Blood Meal
- Cannery By-Products
- Citrus Pulp
- Crab Scrap
- Distillers' Grains
- Fish Meal
- Meat Scraps
- Potatoes
- Sages
- Sludges—Vacuum Filtered
- Sugar Cane Bagasse
- Tankage
- Tomato Pomace
- Wet Corn Millers By-Products
- Yeast Grains

and

Many other products and wastes of the beverage, canning, meat packing, confectionery, dairy, milling, and other food processing industries.

Tear out coupon and mail today!

ARNOLD DRYER COMPANY, Dept. 2514
3025 W. Montana St., Milwaukee 1, Wis.
Gentlemen: Please send me Ardrier Dehydrator bulletins.

Name_____
Title_____ Company_____
Address_____
City_____ Zone____ State_____
ADC-1

Exposes foreign matter and residue! Resists oils, acids, alkalies!

Globe White Neoprene Rubber Belting installed on leading make conveyor.

EXPOSED: Dust, dirt and other accumulations! Product particles that are left behind!

The snowy whiteness of Globe White Neoprene Belting exposes them all to certain detection, enabling immediate elimination with hot water or live steam. *That's sanitation-plus!*

Known as the do-all conveyor belting of the food industry, for which it was specifically developed, Globe White Neoprene Rubber Belting consists of multiple layers of hard-woven, light duck, molded together with highest grade neoprene rubber between the plies and over the entire surface . . . finished with a 3/64" thick, satin-smooth cover on the carrying side and with a friction surface on the pulley side.

The characteristics of this type of construction are unmatched: Exceptional flexibility; high tensile strength; minimum stretch . . . all extremely advantageous in operations where head and tail pulleys are small, and on machines with limited take-up facilities.

Resistant to oil, grease, acids, alkalies — possessing a satiny smoothness that makes no impression whatsoever on the product conveyed, Globe White Neoprene Rubber Belting is today on the "must" list of numerous food processing and handling concerns.

Standard widths up to 48", in 2 - 6 plies inclusive, are available. When inquiring, ask also about Globe White Ruff Top Neoprene Incline Belting, Globe Brown Neoprene Belting, with friction surface on both sides, and Globe Brown Kling-Top Neoprene Belting, with non-slip top for incline and decline conveyors.

Write Dept. E for free samples, literature and the name of your local distributor.

GLOBE WOVEN BELTING CO., INC.
1400 CLINTON STREET BUFFALO 6, NEW YORK
KNOWN FOR QUALITY THE WORLD OVER

head of a piston contacting an end drive plate. As the pump continues to send fluid into the chamber and against the piston head, it builds up a pressure that eventually forces a contact of driving and driven plates.

Thus the two sets rotate as a unit to turn the refrigerating compressor shaft, the engagement being without shock, in much the same manner as in a fluid-type transmission in a passenger car.

The plates are separated and the clutch disengaged, again gradually, by means of a solenoid that opens a valve to allow the hydraulic fluid to flow back to the reservoir. Small coil springs instantly separate the plates when the oil pressure is released.

The solenoid operates in two ways: First, it is connected with thermostats in the truck body to close the by-pass valves and allow the hydraulic pressure to build up whenever the temperature in the body rises above the set level. Second, the solenoid connects electrically with the truck's clutch pedal so that whenever the clutch is depressed, the by-pass valves open to release pressure on the hydraulic clutch.

Thus the solenoid separates the plates in the hydraulic clutch so that the compressor shaft doesn't turn and so the compressor does not run when the driving clutch is depressed.

Hence the refrigerating-system load is off the truck engine when starting, when it is necessary to shift, and when the thermostatically-controlled solenoid does not call for further refrigeration.

No attempt is made to reconcile compressor speed with that of the truck engine, in view of the control features of the system. However, a somewhat larger compressor is provided to assure adequate refrigeration at all times.

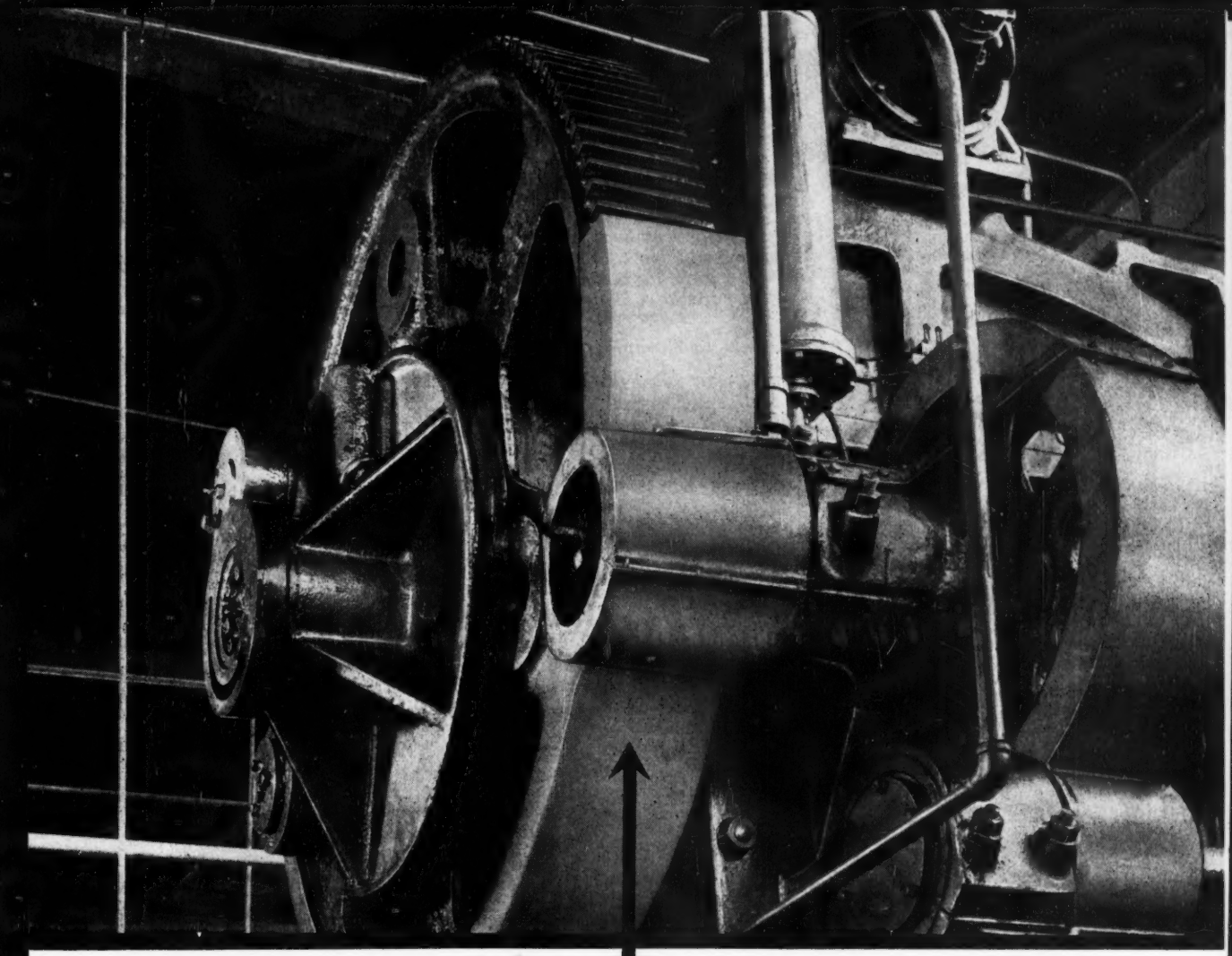
All Kold-Trux refrigerating units include a standby plug-in electric motor for operating the compressor when the truck is parked for long periods.

Another advantage of the system is in choice of clutch drive to accommodate degree of refrigeration required in accordance with the character of the foods carried. With the propeller-shaft drive, the refrigerating unit ceases to operate when the truck stops.

With the gearset power take-off, the refrigerating unit operates only if the truck engine is running.

The kind of food product handled, range of temperatures required, number of door openings enroute, and time in transit all are factors effecting the type and size of the refrigerating cooling units. Offered by the maker is a wide variety of such units, all suitable with the new clutch.

End *(Resume reading on page 49)*



Excessive throw-off stopped with...

Calumet Viscous Lubricants

• The lubrication of exposed gears on a 250 ton press caused trouble for a midwest metal-working company. Lubricant throw-off was excessive, creating unfavorable working conditions; frequent applications of grease interfered with production and raised lubricant consumption. The gear shield in use required pre-heating.

A Standard Oil Lubrication Engineer surveyed the situation three years ago and suggested the use of Calumet Viscous Lubricant 10X, because it is a grease of superior adhesive quality and does not require pre-heating.

Since that time the plant has used Calumet Viscous Lubricant 10X with outstanding results. Run-off to the floors and other parts has been eliminated. Gears are lubricated with maximum efficiency. Most important, lubricant consumption has been cut by more than 20%.

Where open gears as well as some enclosed types are difficult to lubricate, try Calumet Viscous Lubricants. Their superior adhesive quality and greater wetting ability give them high resistance to the washing-action of water and to thinning and throw-off at high temperatures. Several grades of Calumet Viscous Lubricants can be applied by spraying.

Standard Oil Lubrication Engineers are stationed throughout the Midwest. One of these specially trained men is in your area, on the spot when you need him most. To secure his services call your local Standard Oil office. Or write: Standard Oil Company (Indiana), 910 S. Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY STANDARD *(Indiana)*

4½" DIAL THERMOMETERS

Made in 3 types to suit any requirements. Rigid stem, wall or flush mounted, 11 inches of scale reading. Interchangeable with standard industrial separable sockets. Stem can be placed at any angle and case can be rotated to any readable position.

PALMER
MERCURY ACTUATED
Temperature Indicating
Instruments

RECORDING THERMOMETERS

Twelve inch die-cast aluminum case with black or white wrinkle or satin finish. Single or multiple pen construction. Electric or spring wound clock, 24 hour or 7 Day Revolution. Flexible Armor and bulb of stainless steel. Ranges —40 +950°F or Equivalent in °C.

INDUSTRIAL THERMOMETERS

Red-Reading Mercury —Extruded brass case — chrome finish. Ranges —40 + 950°F or Equivalent in °C.

RED-READING MERCURY LABORATORY THERMOMETERS

Thoroughly annealed for permanent accuracy. Complete line A.S.T.M. and fractional division types.

FOR COMPLETE INFORMATION WRITE FOR CATALOG 200 G

PALMER
THERMOMETERS, INC.
Cincinnati 12, Ohio • MElrose 1500

Questions & Answers

THIS MONTH'S PROBLEM

Question—What can you suggest doing to prevent breakage of bottles traveling on a fast conveyor and then being brought to an abrupt stop—as at the infeed to a filling machine?

Answer to November Problem

The Question Was—We are continually plagued with missing floor drain-cover plates. No matter how often we instruct personnel on the importance of always keeping them in place, they still seem to be misplaced and, of course, present a serious safety hazard. Can you suggest what we might do?

Answer—Almost every plant with floor drains—and that includes those involved with about every wet type of processing or packing facility—has experienced this annoyance to some degree. An ideal solution is not easy, as there are drawbacks to several of the obvious solutions.

We can only offer a few suggestions. You may try them out under your own operating conditions and pick out the one giving the best overall results.

Although your clean-up crew may find it annoying, one of the surest corrections would be to attach, with eyebolts, a short length medium-strength coil spring to the cover plate and its drain receptacle. The spring should be long enough and strong enough to enable removal of the plate for clean-up purposes and yet allow it to be re-seated when released. Naturally, spring and fastenings would have to be sufficiently corrosion-resistant for reasonable service-life.

Next best would be the use of a short chain for almost the same purpose. While this chain would not enable automatic reseating, it would, at least, prevent removal and loss of cover plates.

We doubt if it would be practical to provide cover plates actually hinged to the receptacles. But it might be worthwhile to question drain manufacturers of plates on this point.

A final suggestion involves painting the receptacles and cover plates in a hue contrasting with floor color, thus calling attention to any missing plates.

Q.—We are cooking poppy seeds (with water) in a steam-jacketed kettle and then grinding them in an old-fashioned stone roller mill. Is there a method of speeding up the process by eliminating the cooking step?

A.—Try running the poppy seeds through a high-speed hammermill.

More on October Problem

"It is generally believed that solids are of importance in the matter of tomato-paste consistency. However, recent work indicates that solids only play a minor role.

"Consistency of tomato juice is chiefly dependent upon pectic substances. They contribute colloidal properties and keep tissue particles in suspension.

"In the manufacture of tomato juice by the "hot-break" process, crushed tomatoes are rapidly heated to 180 deg. F. to inactivate pectic enzymes. If lower temperatures are used, the enzymes remain active and degrade the pectic substances, thus destroying their colloidal properties and producing a product with poor consistency.

"Enzymes involved are pectin esterase (PE) and pectic acid depolymerase (DP). PE de-esterifies pectin with the formation of pectic acid, which is rapidly hydrolyzed by DP with simultaneous loss of colloidal properties. DP is fairly heat resistant, but has no action on pectin unless it is de-esterified by PE. Thus, inactivation of PE (at 180 deg. F.) indirectly prevents the degradation of pectic substances, and a product of very good consistency is obtained by the "hot-break" process.

"Recent work has shown that retention of pectic substances is necessary to obtain tomato pastes of good consistency. This is achieved by in-

---

How Would *You* Do It?

Readers are invited to submit to FOOD ENGINEERING answers to questions to "This Month's Problem." Selected answers will be published, with credit (unless you specify otherwise). We pay space rates.

What Is *Your* Problem?

Subscribers also are invited to send in food engineering questions. We undertake to provide answers, free, to the best of our ability. We do not undertake costly investigations. Give full information and your name. Your identity will not be disclosed.

Write to Questions & Answers, Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.

activating PE by rapidly pre-heating the tomato macerates to 185 deg. F. If tomato puree is obtained from a manufacturer who does not preheat to this temperature, the puree may not have the desired consistency, although it may have the required solids content.

"Common practice in our country is to add gum tragacanth or other vegetable gums to tomato sauce to prevent separation. Other stabilizers like pectin, alginates, and cellulose derivatives have been suggested for the same purpose. However, before employing any stabilizer, make certain that its use is permitted under the U.S. Food & Drug Act."—*P. N. Pandhi, British Food Manufacturing Industries Research Assn., Leatherhead, Surrey, England.*

Making Marshmallow Squares

Question—Do you have details for the manufacture, on a small scale, of a good quality marshmallow? We wish to make a square-type marshmallow (1x1x1¼ in.), with a moderately firm body.

Answer—Mix ¼ lb. of gelatin (No. 200 test) with 1¼ lb. of water and set aside for 15 min., or longer.

Meanwhile, add 3 lb. of granulated sugar and 1¼ lb. of water into a steam-jacketed kettle and heat to about 160 deg. F. until sugar has dissolved. Turn off heat, introduce soaked gelatine and mix until it dissolves. Now add 2 lb. of Nulomoline and 5 lb. of corn syrup, beat to required volume, and then add flavor (as desired).

Spread batch on heavy wrapping paper, sprinkling surface of marshmallow with coconut, nut meats, or granulated sugar. The marshmallow may also be spread on oiled and dusted trays.

After marshmallow sheets have set, remove paper by lightly moistening it with water. Then sprinkle with coconut, nuts, or sugar and cut into pieces of desired size.

Pieces should be well rolled in the garnishing material, and surfaces of pieces should be well dried before packing.—*James A. King, Nulomoline Div., American Molasses Co., New York City.*

New Cheese-Making Technique

Question — We've been hearing about the use of hydrogen peroxide and mild temperatures in the preparation of Swiss cheese from raw milk. What's the purpose of this new process, and how can we carry it out?

Answer—To the best of our knowledge the process referred to is not be-

...AND *Automatically* YOUR PRODUCT IS PACKAGE-WRAPPED AT *3 to 5 units per second!*

Unbelievable savings in time, labor and materials are yours with the Campbell Wrapper. Automatic continuous feeds and deliveries combined with easy, simple operation permits one person to tend and operate several machines at one time in many cases. Then too, because no trays or stiffeners are required *unless desired,* you cut material costs from 25 to 50%. With the Campbell Wrapper packaging production soars to new heights too, for it automatically crimps, heat or glue seals your products, in any type wrap material, at average speeds of *100 to 300 units per minute!* Wraps regular or irregular shaped products — single or multiple per unit with equal ease and speed. Simplified adjustments require minimum down-time for size change-over. Whatever your product—investigate now, how you can *save* with the Campbell Wrapper.

FOR THE ARMED SERVICES
We are contributing to the nation's defense program by providing a large part of our increased production facilities for building precision armaments. Civilian orders are filled on a reasonable time basis only.

New! Completely revised free booklet—Write for your copy.

Campbell WRAPPER
HUDSON-SHARP MACHINE CO. • GREEN BAY, WIS.
Manufacturers of Aniline and Gravure Presses, Folders, Interfolders, Laminators, Waxers, Embossers, Slitters, Sheeters, Roll Winders, Packaging Machines, Creepers and Tissue Converting Units.

NEW YORK: 55 WEST 42 STREET

For more information, use coupon on page 209.

Increase Your Output up to 300%...

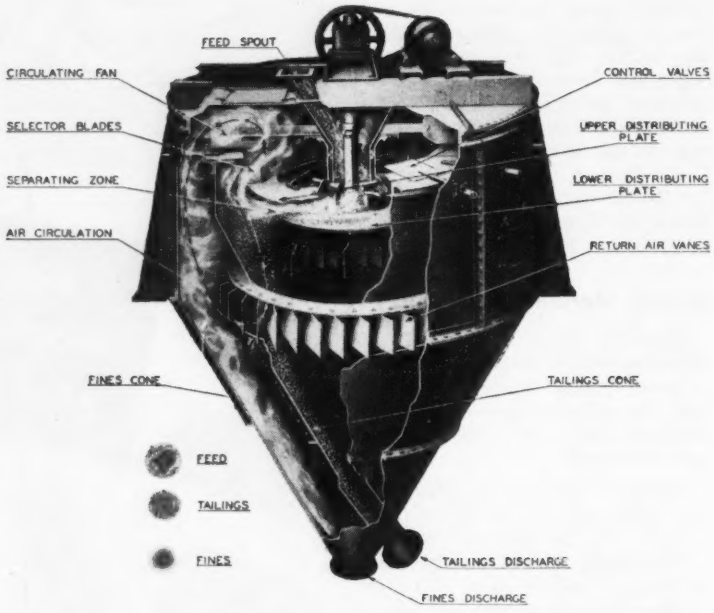
Get Accurate Fines with...

STURTEVANT

Whirlwind Centrifugal SEPARATORS

The Sturtevant Air Separator is one investment that pays off daily profits by increasing production and reducing costs. Its extremely efficient operation assures finer separation of fine material from coarse material with the result that uniform quality of product is always obtained.

They'll not only increase your output by as much as 300%, but provide 10 to 50% savings in power costs, too. They are available in sizes 3 to 16 feet in diameter with capacities from ¼ to 50 tons per hour with a fine-product range of 40 to 325 mesh or finer. Bulletin 087 gives the entire story. Write for your copy.

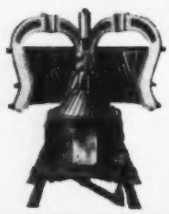


Other Sturtevant Equipment for Increasing Production and Cutting Costs

MICRONIZER® GRINDING MACHINE

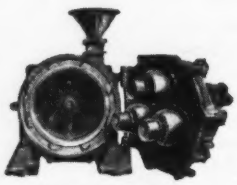
A fluid jet grinding machine, the Sturtevant Micronizer speeds reduction of materials to low micron sizes. These jet mills are especially applicable in fields where a particle size in microns is desired.

Sturtevant Micronizer grinding machines are available in many sizes and capacities.



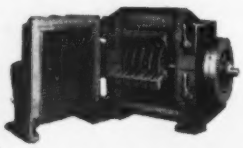
ROTARY FINE CRUSHERS

for intermediate and fine reduction (1" to ¼"). Open door accessibility. Soft or moderately hard materials. Efficient granulators. Excellent preliminary Crushers preceding Pulverizers.



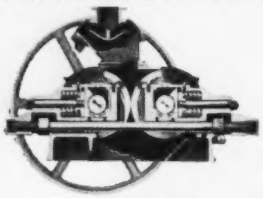
RING-ROLL MILLS

for medium and fine reduction (10 to 200 mesh), hard or soft materials. Very durable, small power. Operate in closed circuit with Screen or Air Separator. Open door accessibility. Many sizes. No scrapers, plows, pushers, or shields.



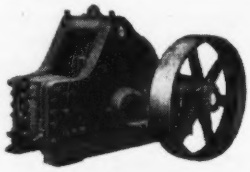
SWING-SLEDGE MILLS

for coarse and medium reduction (1" to 20 mesh). Open door accessibility. Soft, moderately hard, tough or fibrous substances. Built in several types and many sizes.



CRUSHING ROLLS

for granulation, coarse or fine, hard or soft materials. Automatic adjustments. Crushing shocks balanced. For dry or wet reduction. Sizes 8x5 to 38x20. The standard for abrasives.



JAW CRUSHERS

for coarse, intermediate and fine reduction of hard or soft substances. Heavy or light duty. Cam and Roller action. Special crushers for Ferro-alloys. Several types, many sizes.

STURTEVANT MILL COMPANY

106 CLAYTON STREET, BOSTON 22, MASSACHUSETTS

DESIGNERS & MANUFACTURERS OF CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS • MECHANICAL DENS AND EXCAVATORS • ELEVATORS • MIXERS

For more information, use coupon on page 209.

Reader Service

For food-plant employees and consultants only . . .

FOR MORE INFORMATION about equipment, supplies, and processes discussed in the editorial and advertising pages of this issue of Food Engineering . . . mail this coupon

QUICK PRODUCT-FINDER

Accidents 242
Acid, ascorbic 19
Adhesives 10, 152
Air-cond. equip. 85
  Anti-dust 169
  Compressors 120, 216
  Condensers 231
  Fans 110
  Water chillers 141
Alarm system 240
Ammonia, anhydrous 154
Antifoamers 180
Anti-oxidants 83, 177
Batteries 118
Bearings 90, 151
Bellows 239
Blow rings 199, 239
Boilers 18, 239
Brine equip. 101, 145
Can closures 232
Canning system 130
Cans, tin 76, 111
  Straightener 123
Case unit 167
Casters 150
Centrifugals 161
Chains
  Roller 90
  Table-top 90
Chemicals 242
Chillers, water 141
Chlorinators 118
Cleaning equip.
  Bakery 241
  Bottle 38
  Brushes 168
  Case 38
  Eggs 163
  Floors 189, 241
  Nozzles ..217, 226, 234, 238
  Scrubbers 189
  Steam guns 155, 212
  Sweeper 165
  Vacuum cleaners 189
  Washer, veg. 175
Cleaning mtls. 146
  Antiseptics 24
  Bakery 241
  Degreaser 175
  Detergents 212
  Floors, concrete 189
  Sterilizers 173
Closures 94
Clutches 132
Coders 162, 230
Codes, building 242
Colloids 152
Colors, food 2, 83
Compressors 120, 216, 239
Condensers 231
Consultants 242
Containers
  Boxes 15, 69, 84, 162, 187, 251
  Cans, tin 184
  Cartons 89, 187
  Envelopes 184
  Glass 94
  Packages 155
  Plastic 188, 197
  Tea 184
Controls 116-117
  Atmospheres 99
  Flow 139
  Instrumentation 96-97
  Lab., mobile 241
  Level 239
  Measurement 239
  Meters 129
  Moisture 195
  Panels 239
  Positioners 239
  Potentiometers 239
  Quality tags 155
  Research 240
  Retort 72
  Safety 239
  Scales 175, 240
  Tachographs 163
  Temperature ...109, 121, 206 228, 240
  Test 239, 240
  Thermometers 16
  Transmitters 240
Conveyor belting
  Cleat-type 153
  Cotton 225
  Neoprene 204, 226
  Rubber 64, 105
  Steel 229, 231
  Wire 136

CONTINUED ON OTHER SIDE

HERE'S A HANDY INDEX to equipment, supplies and processes discussed in this issue

Simply circle page numbers of items which interest you. More information will come to you direct from suppliers.

Tear on dotted line

TEAR OUT, put in envelope, mail to

Reader Service Department
FOOD ENGINEERING
330 West 42nd Street
New York 36, N. Y.

Please send me additional information on items indicated below.

(FILL IN COMPLETELY. PLEASE PRINT OR TYPE)

Name .....Title .....

Company .....Product .....

Street .....City, State .....

CIRCLE PAGE NUMBERS BELOW

2 All items shown
2a Margarine ingre.
2b Vitamins
2c Vanillin
2d Food colors
4 All items shown
4a Motor repair
4b Motor controls
4c V-belts
4d Pumps
6 Tank cars
8 Fil-Mor Bul. 301E
10 Adhesives
12 Vanilla
14 Cold-storage doors
15 Boxes
16 Thermometers
17 Chain Bk. 2344
18 Temtemper
19a Ascorbic acid
19b Sodium ascorbate
20a Scales
20b Weigher systems
21 Lubricants
22 Raspberry flavor
23 Bucket elevator
24 Antiseptic
25a Cat. C-1205-B
25b Cat. C-5000-B
26 Nickel-bearing stainl.
38A Case cleaner
38B Filter
38C Heat exchanger
38D Bottle washer
39A Truck body
39B "Low-Boy" body
39C Carry cartons
39D Carton attach.
39E Heat exchanger
39F Crown load
64 Rubber belting
66 Labeler
69 Folding boxes
70 All items shown
70a Zest
70b Sweetase
70c Sta-Sol
70d C.S.U.
72 Retort contl.
79 Pyrex piping
80 Flo-sweet
83a Seasonings
83d Food colors
83e Antioxidant
84 Boxes
85 Catalogs 1521, 1525
90 All items shown
90a Deaerators
90b Sterilizers
90c Table-top chain
90d Roller chains
90e Bearings
91 Valve Bk. AD 1944
92 Trucks
93 Vanitrope
94a Containers
94b Closures
95 Steel convyr.
96 Instrumentation
98 Wrapper Bul. 4956
99 Atmosphere contl.
100a Can slitter
100b Scroll shear
101 All items shown
101a Canning salt
101b Bulk salter
101c Brine equip.
101d Salt depositor
102 Pipe & tubing
103 Sorbitol
104 Valves
105 Ribflex
106-107 All items shown
107a Bul. GEA-6013
107b GEA-6012
107c GEA-6027
108 Celite
109 Temp. controls
110 Fans
111 Tin cans
112 All items shown
112a Mixers
112b Ingrediaters
112c Conveyors
112d Aut-O-Melt
113 Ratochlor
114 Tube Bul. T-77
115 Flavors
116 Instru. Cat. 500
118 Batteries
119 Bulletin 902
120 Compressor
121 Temp. controls
122 Can-Do
124 Tin
125-126 Votator
127 Stainl. steel
128 Drive Cat. MR49
129 Meter Bul. 566-LF
130-131 All items shown
130a Basket loader
130b Canning system
131a Filers
131b Conveyors
131c Bulletin F154
132 All items shown
132a Sheave
132b Pillow block
132c Speed reducers
132d Clutches
133 Hose
134 Essential oil
135 Gearmotors
136 Insulation mtls.
137 Purity "NCS"
138 Trucks
139 Rotameter
140 Ingredients
141 Water chillers
142-143 Power systems
144 All items shown
144a Purifier Bul. 700
144b Purifier Bul. 401
144c Prices
145a Salt
145b Brine equip.
146 Cleaners, sanitizers
147a Valves
147b Pumps
147c Tubing
148 Vari-speed drives
149a Essential oils
149b Vanilla
150a Casters
150b Trucks
151 Bearings
152a Colloids
152b Adhesives
153 Sani-Cleats
154a Barrett
154b Labelers
155a Cook-chex
155b Jet cleaner
156 Condensate drainage
157 Drums
158 Scroll shear
159 Motors
161A Centrifugals
161B Jacketing
162A Mag. truck
162B Coder

LISTINGS CONTINUED ON OTHER SIDE

Tear on dotted line

INDEX to equipment, supplies and processes in this issue (See other side)

Conveyors 241
Boom 240
Bucket-type 23, 241
Can 121
Chain-type 17
Gravity 241
Oven-type 196
Polyplane 112
Roller 167
Steel 95
Tubular 236
Vibrating 240
V-type 169
Corn products
Starch 137, 233
Syrup 70
Crowns 89
Crushes 208
Cutting, metal 242
Dairy equip. 240
Deaerators 90
Dehydrators 203
Disintegrators 214
Dispensers, tape 241
Dispensing equip. 242
Dockboards 241
Doors, cold-storage 14
Drainage, condensate 156
Drives 128
Vari-speed 148, 170
Drums, steel 157
Dryers 170, 239
Dust collector 169
Egg cleaner 163
Elec. development 242
Elevators, bucket 23
Emulsifiers 180, 249
Enrichers 241
Fans 110
Feeders 239, 240
Scale 200
Filers 131
Fillers 8, 182, 239
Film 242
Filter aids 108, 250
Filters 38, 171, 190
Beer 173
Horizontal 240
Rotary 177
Water 239
Fittings 176, 242
Plastic 241
Fixtures, lighting 241
Flanges 176
Flavors 115, 140, 149, 238
Butter 177
Coconut 222
Oils, essential 134
Raspberry 22
Sugar 80
Sweeteners 70
Vanilla 12, 149
Vanillin 2
Vanitrope 93
Floor mach. 241
Gearmotors 135
Generators 237, 239
Glassed steel 119
Glycerine 183
Grinders 208
Heaters 85, 239, 242
Heat exchangers 38, 89
Heat-trans. equip. 125-126
Hoists 211
Hose 183, 241
Ice builders 239
Ingredients 113
Insulation mtls.
Asbestos 136
Glass 239, 242
Hardboard 166
Jacketing 161
Kettles 167
Labelers 66, 154
Labels
Aluminum 184
Neck-type 184
Lecithin 70
Lifts, hydraulic 240
Loader, basket 136
Lubricants 21, 205
Margarine ingre. 2
Markers 162, 230
Melters 112
Metals
Cutting 242
Stainless 26, 127
Tin 124
Mills 208
Mixers 112, 235
Mono-rails 240
Monosodium glutamate....70, 236
237, 240, 241
Motors 107, 159-160, 221
Controls 4
Gear-type 135
Repair serv. 4
Nozzles 217, 226, 234, 238
Oils, essential 134, 149
Ovens 196, 239
Overwraps 184, 186, 189
Packager 93, 164, 188
207, 239
Packers, barrel 240
Paper 185, 189
Pillow blocks 90, 132
Pipe & tubing
Plastic 114, 241, 242
Pyrex 79
Stainless 102, 147
Piston packings 190
Plugs 169
Polyethylene 188, 197, 242
Power systems 142-143
Prebreakers 214
Precipitators 239
Processor, hollow-screw 252
Pullers 181
Pulpers 236
Pumps 4, 239
Fire 239
Rotary 228
Stainless 147
Purifiers 144
Ramps, loading 240
Reactors 239
Reducers, speed 182
Refrigeration equip....198, 215
239
Compressors 120, 216
Condensers 231
Plate freezers 234
Seals 239
Tables 242
Water chiller 141
Repellents, rodent 241
Respirators 242
Rolls 208, 239
Safety 242
Salt 145
Canning 101
Tablet depositor 101
Salter, bulk 101
Sanitation serv. 217
Scales 20
Sealers 239
Heat 239
Seals, liquid 239
Seasonings 83, 140
Separators
Centrifugal 208
Magnetic 25
Shear, scroll 100, 158
Sheaves 132
Sifters 213
Slitter, can 100
Sodium ascorbate 19
Solvents 241
Sorbitol 103
Spices 140, 242
Starters, mag. 171
Steam traps 225, 239
Steel, glassed 119
Sterilizers 90, 173
Strainers 230
Strapping 241
Sugar, liquid 80
Surfacing mtls.
Enamel, floor 241
Floors 191, 202
Paint 242
Syrups 229
Tables, conversion 242
Tank cars 6
Tanks, milk 241
Tape
Dispenser 241
Masking 241
Tempering mach. 172
Thickening agents 137, 233
Tile 239
Tin 124
Transmissions, fluid 170
Trucks 150
Attachments 174, 241
Bodies 89
Commercial 92, 138
Dumpers 201
Industrial....163, 194, 240
Lifts 240
Platform 162
Refrig. systems 173
Tachographs 163
Valves 104, 128, 176
Bin-check 240
Brass 91
Iron-gate 165
Safety 239
Stainless 147
Vats 235
V-belts 4
Vegetable proteins 234, 241
Vessels, pressure 239
Vitamins 2, 192
Waxers 175
Wire cloth 241
Wrappers....98, 164, 207, 239

CIRCLE PAGE NUMBERS HERE, FILL IN OTHER SIDE, AND MAIL

LISTINGS CONTINUED FROM OTHER SIDE

162C Boxes
163A Egg cleaner
163B Tachograph
163C Truck
164 Wrappers
165A Iron-gate valve
165B Sweeper
166 Rubatex Bul. 53
167A Case unit
167B Roller conyr.
167C Style C kettles
168 Fullergript
169A Dust collector
169B Flex-A-Plugs
169C V-conveyor
170 Fluid-power trans.
171A ECF filter
171B Mag. starters
173A Sterilizers
173B Truck refrig. system
173C Beer filter
174 Cats. 1266, 1219
175A Baronet
175B Scale 2361
175C Washer, waxer
176 Circ. 115
177A Rotary filter
177B Whitaio
177C Buttafuoa
179 Dryer bulletin
180a Antifoam A
180b AF Emulsion
181 Puller Bul. 146
182 Weigher-filler
183 Glycerine bklt.
184A Sardine can
184B Bacon envelope
184C Neck label
184D Labels
184E Cello. wrap
184F Tea package
185 Packages
186 (ad) Wire mesh belts
186A Wrapper
187 (ad) Boxes
187A Cartos
188 (ad) Packager
188A Potato bag
189 (ad) All items shown
189a Floor machine
189b Scrubber
189c Vac. cleaner
189d Concrete floors
189A Glassine paper
189B Glassine paper
190a Bulletin 4502
190b Bulletin 4401
191 Floor mtl.
194 Trucks
195 Data File 45F-18
196a Ovens
196b Conveyors
197 Visqueen "C"
198 Poultry chilling
199 Dust Bul. 528-R
200 Scale feeders
202 Floor Bul. 3-2
203 Dehydrators
204 Neoprene belting
205 Lubricants
206 Temp. Cal. 200G
207 Wrapper
208 All items shown
208a Bulletin 087
208b Grinders
208c Crushers
208d Mills
208e Rolls
211 Hoists
212a Detergents
212b Steam gun
213 Ro-Ball sifter
214a Disintegrators
214b Prebreakers
215 Bulletin 105
217a Plant sanitation
217b Nozzle Cat. 6A, 6C
219 Boiler Cat. AD-100
221 Motors
222 Coconut flavor
225a Trap Bul. 853
225b Conyr. belting
226a Nozzle Bul. N-616
226b Belt Bul. 20
228a Temp. indicators
228b Pump Bul. 54SE
229a Steel belting
229b Syrups
230a Strainer Bul. S-203
230b Coder ROL-1
231a Belt Cat. 4
231b Condenser Bul. 234
232 Can closures
233 Paygel
234a Plate freezers
234b HVP
234c Nozzle Cat. 24
235 Kold-Vat
236a Conyr. Bul. 154
236b MSG
236c Pulper
237a Generators
237b MSG
238a Flavors
238b Nozzles
239A Heat sealers
239B Boilers
239C Ice builders
239D Pump Bul. 7226
239E Dryer Bk. 2413
239F Glass insul.
239G Tile Bul. A-153
239H Bellow Bul. 300
239I Valve Circ. 502
239J Bulletin 528
239K Bulletin 5001A
239L Oven Bul. 51
239M Refrig. Cat. 54-R
239N Air compressors
2390 Precipitators
239P Wrappers, sealers
239Q Roll Cat. 48
239R Heater Bul. 600A
239S Filter Cat. 300
239T Fillers
239U Positioner Bul. 473
239V Safety Bul. C-54
239W Pressure vessels
239X Trap Bul. 853
239Y Generator Bul. GB-153
239Z Seal Bul. 241
239AA Pump Form 57
239AB Feeder
239AC Potentiometers
239AD Catalog GEC-1016A
239AE Test Cat. 653
239AF Level indicator
239AG Board Bul. 700
240 (ad) All items shown
240a Bin-check valve
240b Barrel packers
240c Feeders
240d MSG
240A Trans. Bul. 2653
240B Leaflets B7, B8
240C Scale Cat. 10
240D Test Bul. 32
240E Temp. Bul. 300
240F Form 8H853
240G Trans. Bul. 742
240H Filter Bul. 11-1051
240I Alarm system
240J Lift truck
240K Conyr. Bul. 353
240L Monorail Bk. 2008
240M Conyr. Bul. BC
240N Ramp Bul. DB-211
2400 Lift Cat. M54
240P Dairy Bul. 54-DJ
240Q Truck Bul. P1512B
241a (ad) MSG
241b (ad) HVP
241A Bulls, MT53223, 52253
241B Dockboards
241C Fork types
241D Conyr. Cat. 1053
241E Bucket Bk. 2465
241F Form 642-OPC-1-53-5M
241G Wire Bul. 106
241H Tablet Bul. 42
241I Plastics
241J Repellent Bul. 19
241K Strapping
241L Tape
241M Bakery Bklt. 6-53
241N Floor enamel
2410 Solvent
241P Fixture Wk. 31-F-23
241Q Air hose
241R Mobile lab.
241S Floor Bul. 619
241T Tape Bul. DT-3
242a (ad) Spices
242b (ad) Consultant
242A Bul. 5308, CS-57500
242B Plastic films
242C Paint Bk. 500-197-20M
242D Pipe Bklt. 603
242E Insul. Bul. 37-D-1
242F Dispensing Cat. 40
242G Fittings Cat. 553
242H Respirator Bul. 2309
242I Accident Bk. 10
242J Consultant bklt.
242K Heaters
242L Conversion tables
242M Generating plants
242N Building codes
2420 Metal cutting
242P Film
249 Myvatex
250 Filter aids
251 Boxes
252 Hollow-screw processor

Coupon expires April 10, 1954

Don't forget . . . fill in name and address on other side

January 1954

ing carried out commercially, and we question if it has met with the approval of FDA and state regulatory officials.

The process is designed to accomplish much the same as pasteurization —destroying objectionable bacteria in raw milk used for cheese-making. However, peroxide treatment reportedly makes a better cheese since adverse effects attributable to high temperatures are abolished.

If you wish to try out the process, proceed in this manner:

Heat raw milk to 120-130 deg. F. and add 3.2 oz. of 35 percent hydrogen peroxide (edible grade diluted with 3-4 volumes of water) to each 100 lb. of milk. Mix well and immediately cool milk to 95 deg. F. Allow the peroxide to react ½-1 hr. (no longer). Slowly add, with stirring, 3 ml. of catalese enzyme diluted with eight parts of water. Slowly agitate for ¾ hr. and then test for complete removal of peroxide.

This test is made by adding a few drops of fresh 25 percent solution of potassium iodide to a test tube of treated milk. If the test is positive (formation of yellow color), more catalese should be added.

Now cool milk to desired setting temperature and add starter (rennet extract) and "eye formers" (Propionbacterium shermanii) in the usual manner.

Re Diabetic Ice Cream

Question—We are planning to manufacture a packaged, diabetic ice cream. Can you furnish us with a suitable formula?

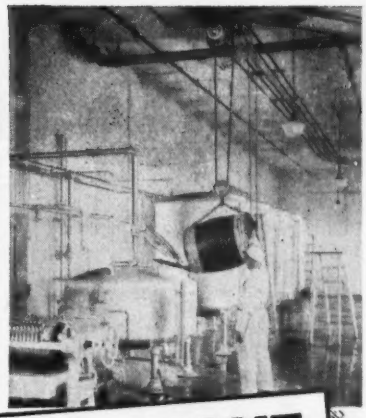
Answer—The problem in making a diabetic ice cream is to remove sugar solids without changing the freezing point of the product. Increasing the milk-solids-not-fat is impractical since they contain approximately 54 percent lactose. And, because of the high solids, saltiness and sandiness would occur.

The substitution of large amounts of butterfat for solids results in a high caloric content.

Some success has been obtained with the use of low-lactose milk powder.

Recently, there has been considerable interest in the use of sorbitol, a sweet-tasting alcohol. In addition to sweetening the product, it lowers the freezing point to provide the ice cream with a normal body and texture. Sorbitol is not readily assimulated as a sugar, and its low insulin requirement makes it suitable for diabetic ice cream.

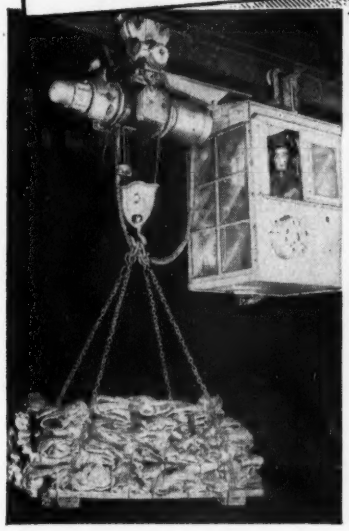
Suggested is a 50-50 blend of Sorbo



SHEPARD NILES
Floor-Operated Hoist

Operator mainly occupied with other duties. Hoist used for fast, efficient handling of relatively short hauls.

WHICH HOIST is RIGHT FOR YOUR JOB?



SHEPARD NILES
Cab-Operated Hoist

Operator in cab moves loads along at high speeds—occupies best vantage point for spotting or stacking materials.

Choosing the hoist that's right for your job calls for expert advice.

Let the Shepard Niles representative in your area guide you in your choice. He specializes in through-the-air handling—knows which type of hoist will best fit your job.

SHEPARD NILES
CRANE AND HOIST CORPORATION

MAIL COUPON

SHEPARD NILES CRANE and HOIST CORP.
1240 Schuyler Ave., Montour Falls, N.Y.

( ) *Please send me your latest Hoist Bulletin.*
( ) *Please have a representative call.*

NAME _____ TITLE _____
COMPANY _____
STREET _____
CITY _____ STATE _____

For more information, use coupon on page 209.

This plant cut cleaning job from 48 hours to 3 hours

Processor saves 45 man hours by applying Oakite Detergent with Oakite Steam Gun—better results reported also.

Conveyor equipment, filler machines and exteriors of washers and other equipment at this plant needed a thorough going over—to prepare them for painting. Formerly, this work had required 3 men, laboriously working 48 hours with brush, scraper, solvent and soap solutions.

The problem was put up to the Oakite Technical Service Man. He suggested a solution of Oakite Composition No. 82 and the Oakite Steam-Detergent Gun.

Result: The job was done in less than 3 hours, by only one man. Yes, 3 man hours instead of 48. And it was done better because the gun and solution got into tight spots never before accessible by hand.

Proving that—in industrial cleaning it always pays to consult Oakite.

The Oakite Steam-Detergent Gun has many profitable applications in food plants. It helps pay for itself by cutting cleaning time in half. And it cleans more completely by combining heat, detergency and force into a dirt-banishing team. The Oakite Technical Service Man will gladly demonstrate.

This booklet tells other ways you can save money and simplify cleaning, sanitizing, and descaling operations in your plant with special Oakite materials. Write Oakite Products, Inc., 27A Rector St., New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING

OAKITE

MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U. S. and Canada

(70 percent d-sorbitol solution) and powdered mannitol (commercial grade). Mannitol is similar to sorbitol, and it has about the same properties.

In making an approximate 100-lb. mix, use 40 percent cream, 30 lb.; "Sorbo" (made by Atlas Powder Co.), 15 lb.; low-lactose (milk-solids-not-fat), 9.0 lb.; water, 45.7 lb.; and stabilizer, 0.3 lb. Also use 0.001 percent of saccharin.

Use a pure stabilizer without added sugar. You might also consider using the new sweetening agent—sucryl sodium—in place of saccharin.

The mix should be processed in the usual manner, and care must be exercised to avoid blending it with the regular ice cream mix. And use only sugar-free flavors such as vanilla, coffee, or maple.

Watertight Concrete Floors

Question—We are in the stage of planning the construction of a modern fish-filleting and freezing plant. And since the floor in main processing area will receive considerable amounts of water, we want to make certain that it will be leak-proof. Can you suggest how we can go about laying a leak-proof concrete floor?

Answer—Our suggestion is that you contact one of the large manufacturers of cement. He is well qualified to provide you with the necessary technical information on best known methods of constructing watertight concrete floors—particularly in your case.

But we won't avoid answering by passing the buck.

Of course, degree of watertightness desired will depend somewhat upon how much you wish to spend. Involved are cost of waterproofing material, heavy reinforced concrete floor above it, and structure itself due to additional dead load.

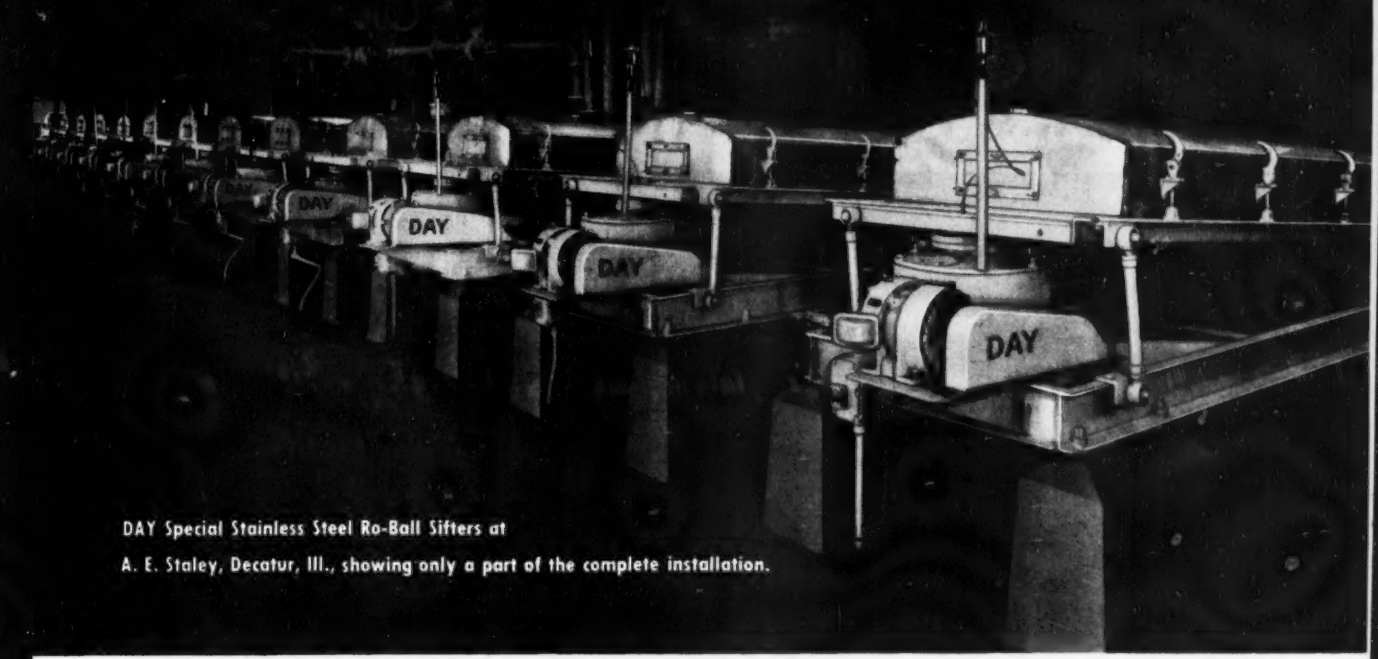
First, prerequisite in pouring a watertight concrete floor is to use a good, dense mixture—such as one part of Portland cement to six parts of well graded aggregate.

While a floor poured with a lean

Q.—In referring to jellies, what is meant by syneresis?

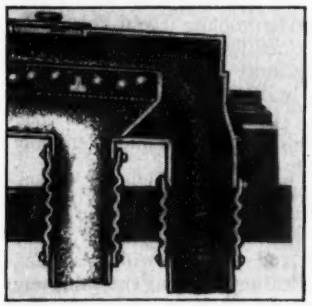
A.—In extreme cases, syneresis refers to excessive bleeding or weeping of jellies. It can be traced to: (1) premature setting, causing a break in the pectin network; (2) insufficient pectin, resulting in a not-sufficiently-dense pectin network for holding the syrup; (3) too much fruit acid, bringing about a hydrolysis of the pectin; and (4) not enough sugar.

DAY | means longer life span



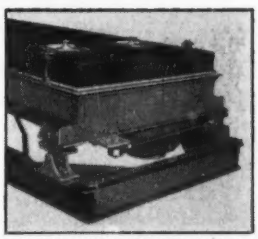
DAY Special Stainless Steel Ro-Ball Sifters at
A. E. Staley, Decatur, Ill., showing only a part of the complete installation.

✻ Extra long life for your equipment is assured by DAY's unmatched ability to combine rugged construction with precision engineering. An impressive list of users have found this true of the DAY Ro-Ball Sifter, which accomplishes 100% elimination of foreign material and ideal aeration. Key to its outstanding performance is the Super-Active Ball Cleaning Device. Scores of rebound points are provided in each compartment, resulting in even vibration over the entire screen surface. The extremely fine mesh stays clean and open, allowing free passage without crushing or forcing.



SUPER-ACTIVE BALL CLEANING DEVICE

Dust-proof Inspection Ports, with cast aluminum rim and cover, are precision-fitted. For complete information on these and many other features — including self-aligning tail end bearings, stabilizing drag link, and stabilizer to prevent rocking—simply call your nearest J. H. Day field engineer or write us direct for Bulletin.



SELF-ALIGNING TAIL END BEARINGS

FOUNDED 1887

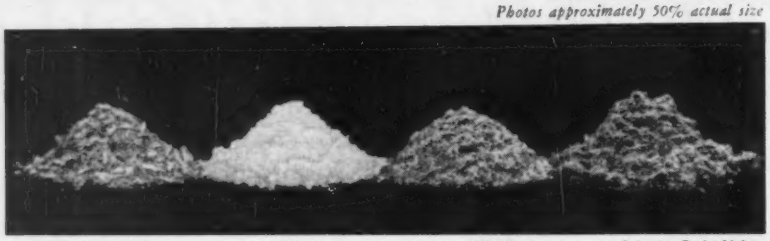
when you buy **DAY** *you buy dependability*

THE J. H. DAY COMPANY
INCORPORATED
1146 HARRISON AVENUE • CINCINNATI 22, OHIO

PRODUCERS OF QUALITY EQUIPMENT FOR BAKING • PAINT & VARNISH • CHEMICAL RUBBER • PHARMACEUTICAL • COSMETICS • PAPER & PULP • EXPLOSIVES • FOOD CERAMICS • CANDY • SOAP • SUGAR • MILK PRODUCTS • OTHER MAJOR INDUSTRIES

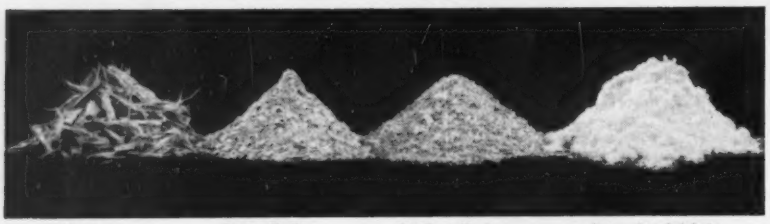
Like to speed production

Photos approximately 50% actual size



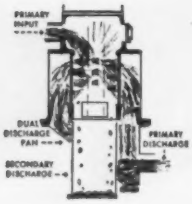
Argentine Prairie Bone 1/4" square screen, 3600 RPM
Polystyrene 3/8" screen, 3600 RPM
Flax Seed 1/8" screen, 3600 RPM
Asbestos Brake Lining 1/4" screen, 3600 RPM

on size reduction?



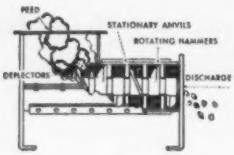
Wood 3/4" screen, 3600 RPM
Oyster Shell 3/16" screen, 1800 RPM
Soy Bean Meal 1/8" screen, 3600 RPM
Ammonium Sulphate 1/32" screen 6" blank, 3600 RPM

Rietz equipment can help!



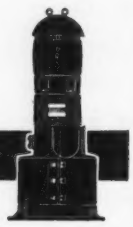
DISINTEGRATORS

For efficient, high-capacity particle size reduction on wet, moist, or dry services . . . fine or coarse . . . crushing, grinding, pulverizing, pulping, shredding, triturating, fiberizing, continuous high-capacity mixing. Differential discharge continuously separates unwanted disintegration-resistant material or provides by-product. Full 360° screen increases capacity, reduces power consumption, minimizes plugging. Stainless steel sanitary units available.



PREBREAKERS

For coarse reduction of large-size, extra-tough and hard-to-handle materials.
Low speed, low power, compact.
Positive-breaking action.



Write for free literature or details of our free laboratory testing program

Rietz MANUFACTURING CO.

132 Todd Road • Santa Rosa, California

Equipment for the food and chemical process industries

concrete mixture may have required structural strength, it may not have essential impermeability. Moisture may penetrate floor and rust reinforcing steel, eventually resulting in spalling concrete.

It is good practice to avoid specifying concrete by structural strength. Sure, contractor can reduce amount of water in a very lean concrete mixture and meet specified strength, but he'll also give you a very porous concrete.

A dense concrete can be made by using admixtures which tend to eliminate voids and reduce shrinkage cracks. Cost of these admixtures usually can be offset by slightly cutting down on the amount of cement.

Nothing, however, will take the place of thorough mixing and careful placing of cement. Helpful in elimination of voids during placing of cement is use of power vibrators.

Best way to construct a watertight-floor in your case is to install a membrane water-proofing over structural concrete slab. Look into the possibility of using two plies of asphalt-saturated roofing felts and one ply of asphalt-saturated cotton fabric for reinforcement. Felts and fabric should be well mopped with hot, self-sealing, low-melting point asphalt. Then pour the concrete topping.

You can still have leaks with membrane waterproofing if you do not install it carefully. For example, waterproofing must be sealed against floor drains, walls, columns, pipes, and sleeves. If it isn't, then water may seep under membrane and eventually penetrate concrete slab.

For floor drains, use drainage flanges with clamping rings and weep holes. Rings should be heated as hot as the asphalt and secured with clamping nuts. Heating clamping rings this way will soften asphalt to assure a better seal.

Weep holes take care of any water that is likely to back up between concrete slab and waterproofing in case it is not tightly sealed to drainage flange.

Q.–Powdered sugars in some formulas are sometimes designated by a number of X's–XXXX and XXXXXX, for example. Just what do these X's refer to?

A.–The X's indicate fineness of sugar, with greater number of letters denoting a finer sugar. There are, however, no uniform standards on the use of X's. So, XXXX sugar from one refiner may be different in grain size from one similarly marked by another manufacturer.

To seal joint between curb and wall or column, use a good grade of elastic gun-grade caulking compound or a Para-Plastic sealing compound.

Secure waterproofing against round columns or sleeves with a clamping ring.

On Lebanon Bologna

Question—We've been seeking high and low for a formula and information on manufacturing Lebanon bologna. Can you help us?

Answer—To make Lebanon bologna, grind through a ½-in. plate 150 lb. of boneless, lean beef chuck. Add ground beef into a mixer and thoroughly blend with curing ingredients consisting of salt, 6 lb.; cerelose (corn sugar), 13½ oz.; sodium nitrate, 1 oz.; and sodium nitrite, ⅜ oz.

Spread the meat in pans to a depth of about 6 in.—no more. Cure meat in 38-40 deg. F. cooler for four days.

Now remove meat from cooler and mix while adding pepper (white), 9¾ oz.; ginger (ground), 1⅞ oz.; mace (ground), 1⅞ oz.; mustard (ground), 1½ oz.; and lard (melted), 1½ pt.

Next grind the meat through a ⅝-in. plate, and stuff into cellulose casings (3¾x20 in.). Load bolognas into wooden-lined smokehouse. Close dampers, and smoke about one day with wet sawdust at lowest possible temperature. During this low smoke, the bolognas will sweat and firm up.

Finally open the dampers, remove wet sawdust, and smoke three days with dry sawdust.

Has Triple Mixing Problem

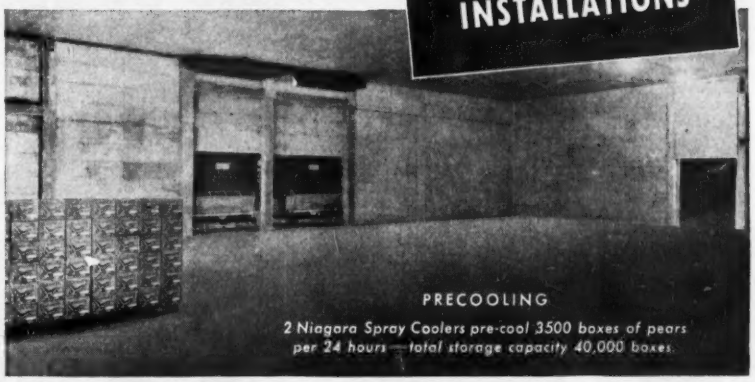
Question—Our company manufactures dessert powders in a horizontal, batch-type ribbon mixer. The products comprise a large proportion of sugars and a relatively small amount of liquid (color and flavor solutions). Three things trouble us in our mixing operations: (1) Lumps in the finished product, (2) dust created during mixing, and (3) encrustation on mixer shell and blades. Product adhering to the mixer must be removed between flavor changes with the consequent loss of production time. Could you suggest improvements in equipment or process to eliminate some or all of these problems?

Answer—We assume that the lumping referred to results from incomplete mixing of liquid with dry ingredients. If so, then to screen out the lumps would deprive the product of needed color and flavor.

As far as correcting either the dusting or encrustation, the use of a dif-

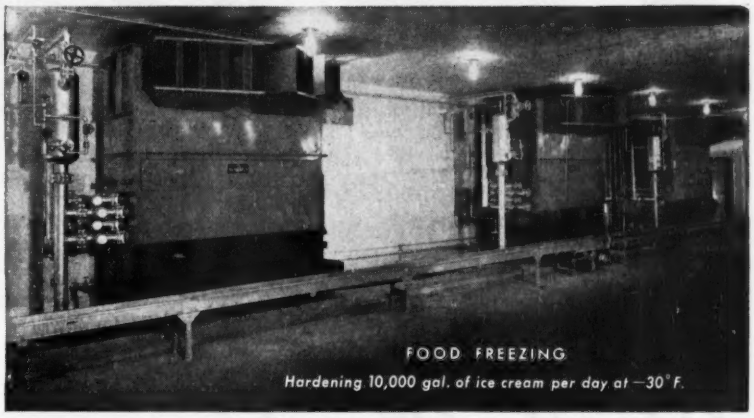
NIAGARA "No-Frost"

SUCCESSFUL IN BIG INSTALLATIONS



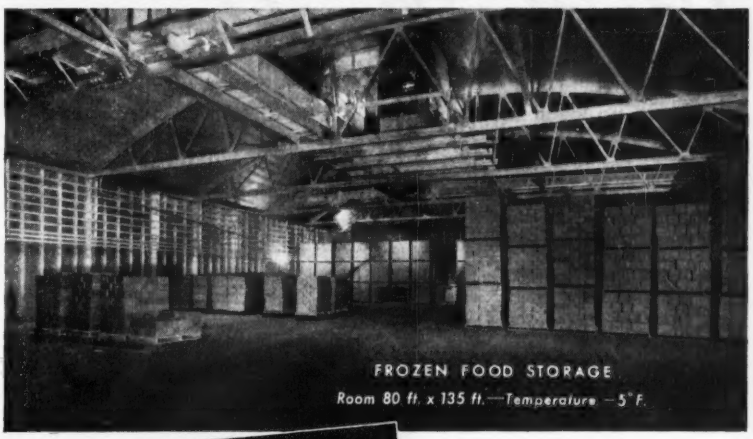
PRECOOLING

2 Niagara Spray Coolers pre-cool 3500 boxes of pears per 24 hours—total storage capacity 40,000 boxes.



FOOD FREEZING

Hardening 10,000 gal. of ice cream per day at −30° F.



FROZEN FOOD STORAGE

Room 80 ft. x 135 ft.—Temperature −5° F.

NIAGARA "No-Frost" gives you extra capacity and better operation. It improves quality, especially in foods, where it brings the product to correct temperature faster and holds it without fluctuation. It saves money for you in the cost of power and labor. With Niagara "No-Frost" there is never any "de-frosting" loss of time or temperature rise.

Write for Bulletin 105

NIAGARA BLOWER COMPANY

Dept. FI, 405 Lexington Ave. New York 17, N. Y.

Sales Engineers in Principal Cities of U. S. and Canada

For more information, use coupon on page 209.

This is Why the Nash is the Most Simple Compressor

It's the Nash!

There are no mechanical complications in a Nash Compressor. A single moving element, a round rotor, with shrouded blades, forming a series of buckets, revolves freely in an elliptical casing containing any low viscosity liquid. This liquid, carried with the rotor, follows the elliptical contour of the casing.

The moving liquid therefore recedes from the rotor buckets at the wide part of the ellipse, permitting the buckets to fill with gas from the stationary Inlet Ports. As the casing narrows, the liquid is forced back into the rotor buckets, compressing the gas, and delivering it through the fixed Outlet Ports.

Nash Compressors produce 75 lbs. pressure in a single stage, with capacities to 6 million cu. ft. per day in a single structure. Since compression is secured by an entirely different principle, gas pumping problems difficult with ordinary pumps are often handled easily in a Nash.

Nash simplicity means low maintenance cost, with original pump performance constant over long periods. Data on these pumps sent immediately on request

No internal wearing parts.

No valves, pistons, or vanes.

No internal lubrication.

Low maintenance cost.

Saves floor space.

Desired delivery temperature automatically maintained.

Slugs of liquid entering pump will do no harm.

75 pounds in a single stage.

NASH ENGINEERING COMPANY
313 WILSON, SO. NORWALK, CONN.

KLENZADE

Sanitation Services FOR FOOD PLANTS

Engineered to Your Needs

- ★ Plant Sanitation Survey
- ★ Determination of Food Soils
- ★ Organization of Cleaning Schedules
- ★ Water Stabilization
- ★ Water Chlorination
- ★ Utensil Cleaning and Sanitizing
- ★ Heavy Equipment Cleaning and Sanitizing
- ★ High Temperature Equipment Cleaning and Sanitizing
- ★ Environmental Sanitation
- ★ Mold and Algae Control
- ★ Odor Control
- ★ Special Bactericidal Treatments
- ★ Special-Problem Laboratory Services

There's a Klenzade field technician near you. His services in helping you plan a complete Plant Sanitation Program are yours without obligation. Write us now.

KLENZADE PRODUCTS, Inc.
BELOIT, WISCONSIN

ferent type of mixer may be required. For example, a double-cone blender might offer several advantages. Among them are a dust-tight construction (liquid could be introduced through the trunnions) and a smooth inner surface that could be quickly and thoroughly hosed down or steamed between flavor changes.

In some cases, this type mixer produces a thorough blend within a few minutes. Use of it might considerably shorten the mixing cycle.

It might be necessary to make some formula adjustments to correct for the absence of moisture evaporation or volatilization of flavor in a completely sealed mixer.

Mixing is something that is very difficult to predict theoretically. However, you will find manufacturers of mixing equipment most cooperative in carrying out small-scale tests for evaluating their units.

About a Re-Usable Ice

Question—Have you any information on a non-liquid, non-melt "ice" that is reportedly used for distribution of perishable foods in shipping cartons?

Answer—There is a coolant available, which consists of cold-retaining chemicals held in colloidal suspension in a gel base. Marketed under the brand name, Sno-Gel, this new coolant is molded in suitable containers and, depending upon chemicals used in the formula, can be frozen at 30, 10, or −8 deg. F.

Several blocks of the refrigerant may be placed in the shipping case (on top of product). Refrigerant slowly loses its chilling properties and thus protects perishables for a normal delivery run—without the need of refrigerated carriers. Too, the new chemical neither loses its shape nor does water run off to wet the shipping case.

The spent refrigerant can be picked up, re-frozen, and re-used.

On Making Gum-Type Jelly

Question—Do you have a formula and details on the manufacture of gum-type jelly candies using modified pectin (sodium pectate)?

Answer—"Mix 1 lb. of modified pectin with 12¼ lb. of sugar, add to 2½ gal. of water, and boil until dissolved. Now add 35 lb. of corn syrup and again bring to a boil. At this point, introduce 1½ oz. of modified pectin buffer (setting salt) dissolved in 4-5 oz. of water and heat to 224 deg. F. Turn off steam and add 12¼ lb. of

SCRUBBING CORROSIVE GASES ?

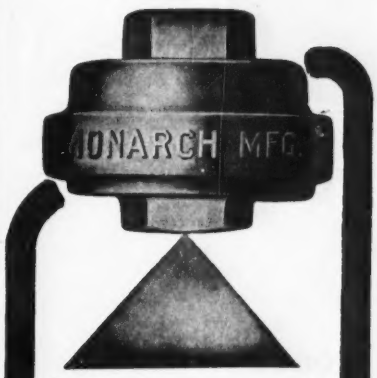


Fig. 645

Are your scrubbing nozzles as efficient as you think they could be? Do they resist the corrosion or wear conditions satisfactorily — produce the breakup and distribution you would like?

Outline your spray problem for use — if your liquid can be sprayed with direct pressure at all — Monarch can furnish the nozzles.

NOZZLES FOR:

- OIL ATOMIZING
- HUMIDIFYING
- AIR WASHING
- DESUPERHEATING
- SPRAY PONDS
- MILK POWDERING
- ACID CHAMBERS
- CONCRETE CURING

Write for Catalog 6-A and 6-C

MONARCH MFG. WKS., INC.
2517 E. ONTARIO ST.
PHILADELPHIA 34, PA.

Just Published!

PUMPS

Types, Selection, Installation, Operation, and Maintenance

A complete and practical treatment of pumps and pumping problems. Discusses pump applications, performance, and service limitations . . . gives details on installing, operating, and maintaining them at peak efficiency. All important types are covered, including: reciprocating, centrifugal, turbine, propellor, and rotary pumps. Important types, like deep-well, boiler-feed, sewage and sludge, and sanitary pumps are treated in separate chapters. **By Frank A. Kristal, Lic. Prof. Engr., and F. A. Annett, Contributing Editor, POWER. 2nd Ed., 373 pp., 417 illus., $6.50**

SANITATION for the FOOD PRESERVATION INDUSTRIES

Presents workable principles and methods of good plant sanitation—"how-to-do-it" help for all food processors, and particularly useful to the canning, freezing, and dehydration industries. **Prepared by the Assoc. of Food Industry Sanitarians, Inc., in cooperation with the Nat'l Canners Assoc. 284 pp., 118 illus., $5.50**

STATISTICAL QUALITY CONTROL

Gives explicit help to set up and maintain topnotch statistical quality control for best results on the production line. Explains cost-cutting methods you can put to work in short time with a minimum of trouble and expense. **By E. L. Grant, Prof. of Econ. of Engr., Stanford U. 2nd Ed., 557 pp., 94 illus., 19 tables, $6.50**

QUALITY CONTROL HANDBOOK

Detailed answers to your questions on any phase of planning and carrying out a quality-control program. Provides quick reference to many formulas, data, record forms, and other practical information. **Edited by J. M. Juran, Consulting Mgt. Engin. & Prof. of Mgt. Engineering, N. Y. U. 768 pp., 176 illus., $7.00**

PLANT ENGINEERING HANDBOOK

Shows how to run an industrial plant efficiently and economically. Covers the economic, mechanical, chemical, and power operations of a plant . . . and gives essentials of today's good practice in 76 areas of plant operation and maintenance. **William Staniar, Editor-in-Chief, 1955 pp., 1406 illus., 544 tables $15.00**

CHEMICAL ENGINEERS' HANDBOOK

In this standard reference of modern chemical engineering practice and fundamentals more than 140 authorities bring you technical data, new procedures, modern applications, new equipment, etc., in every branch of chemical engineering. **J. H. Perry, Editor, Technical Investigator, E. I. DuPont de Nemours & Co., 3rd Ed., 1942 pp., over 2000 illus., $17.00**

10 DAYS' FREE EXAMINATION

McGraw-Hill Book Co., 330 W. 42 St., NYC 36

Send me book(s) checked below for 10 days' examination on approval. In 10 days I will remit for book(s) I keep, plus few cents for delivery, and return unwanted book(s) postpaid. (We pay for delivery if you remit with this coupon—same return privilege.)

- ☐ Kristal & Annett—PUMPS—$6.50
- ☐ AFIS—SANIT. for the FOOD PRESERV. IND.—$5.50
- ☐ Grant—STATISTICAL QUALITY CONTROL—$6.50
- ☐ Juran—QUALITY CONTROL HANDBOOK—$12.00 (payable $4 in 10 days; $4 a month)
- ☐ Staniar—PLANT ENGINEERING HANDBOOK—$15.00 (payable $3 in 10 days; $3 a month)
- ☐ Perry—CHEMICAL ENGINEERS' HANDBOOK—$17.00 (payable $5 in 10 days; $4 a month)

(Print)

Name .....

Address .....

City .....Zone....State.....

Company .....

Position FOOD-1

This offer applies in U. S. only

sugar. After the sugar is dissolved, add color and flavor and cast in starch molds."—*F. M. McIntire, T. H. Angermeirer & Co., N. Y. C.*

Making French Dressing

Question—To complete our line of sauces and dressings, we'd like to include French Dressing. Can you furnish us with a formula for this product, together with complete directions for manufacturing a top-quality French dressing?

Answer—Before preparing the batch of French dressing, it is first necessary to make up the following: Paprika-oil blend, mustard-oil blend, onion juice, and celery extract.

Paprika-Oil. Into a steam-jacketed kettle pour 10 gal. of vegetable oil (corn or cottonseed). Sprinkle over oil 10 lb. of a good grade of paprika. Heat to 180 to 185 deg. F. with constant agitation. Then let stand overnight and strain.

Mustard-Oil Blend. In a glass-lined container blend 1 oz. of mustard oil (U.S.P.) with 15 lb. of refined vegetable oil.

Onion Juice. Blend ½ lb. of white onion powder with ½ gal. of 100 deg. F. water in a glass container. Caution: Make only enough onion juice for one day's production.

Celery Extract. Bring to boil an equal amount of ground celery seed and 50-gr. cider vinegar. Allow to settle and then decant. For every gallon of decanted extract add ½ gal. of 50-gr. cider vinegar.

Now to making the final batch of French dressing:

Into a vertical-type beater (Glen or Hobart) add: Salt, 1¼ lb.; ketchup, 1 lb.; sugar, 4 lb.; cayenne pepper, ½ oz.; Worchestershire sauce, 2½ oz.; garlic powder, a trace or pinch; onion juice, 4 oz.; celery extract, ½ lb.; and water, 2½ lb.

Now add to a receptacle directly above the mixer: Vegetable oil (corn or cottonseed), 17½ lb.; mustard-oil blend, 5 fl. oz.; and paprika-oil blend, 1½ pt. Start the mixer and introduce the oils in a very fine stream. After about one-fourth of the oil is added, introduce an oil-gum tragacanth suspension (2¾ oz. of gum and 1 pint of oil). When all the oil has been added, introduce 8¼ lb. of 45-gr. cider and 5⅛ lb. of water into the receptacle above the mixer, blend well, and feed in a small stream to the batch.

Total time for mixing the oils into the batch takes about 7½ min. Time for mixing the water and vinegar blend into the batch should take about 5 min.

Finally, run mixer an additional minute. Batch should then flow through a fine-mesh screen prior to filling into bottles.

Has By-Product Problem

Question—Have you any suggestions on how we might use waste chips during the processing of ready-peeled potatoes that are being put up for the institutional trade?

Answer—You might look into the possibility of using these peeled potato chips in frozen mashed potatoes or frozen cod fish cakes (fried or unfried).

To make frozen mashed potatoes: Merely cook the peeled chips in a perforated basket immersed in a steam-jacketed kettle partially filled with water. Then transfer the cooked potatoes into the bowl of a beater-type mixer and blend, until fluffy, with the required amount of milk, salt, white pepper, and butter. Finally pack into 12- or 16-oz. carton, freeze, and overwrap cartons.

To prepare cod fish cakes: Soak overnight in water, 20 lb. of shredded salt cod, and then transfer into perforated basket immersed in steam-jacketed kettle partially filled with water. Now add 40 lb. of peeled potato chips, and boil 30 to 45 min. Run fish and potato mix through plate-type grinder. Transfer batch into bowl of beater-type mixer, along with sufficient citric acid to prevent discoloration, and thoroughly blend with 1 lb. of hydrogenated coconut oil and 2/5 oz. of white pepper. Form into fish cakes, pack fried or unfried into cartons, overwrap cartons, and then freeze.

If you have canning facilities, bulk-pack into 8-oz. flat cans, and heat-process in retorts for 75 min. at 240 deg. F.

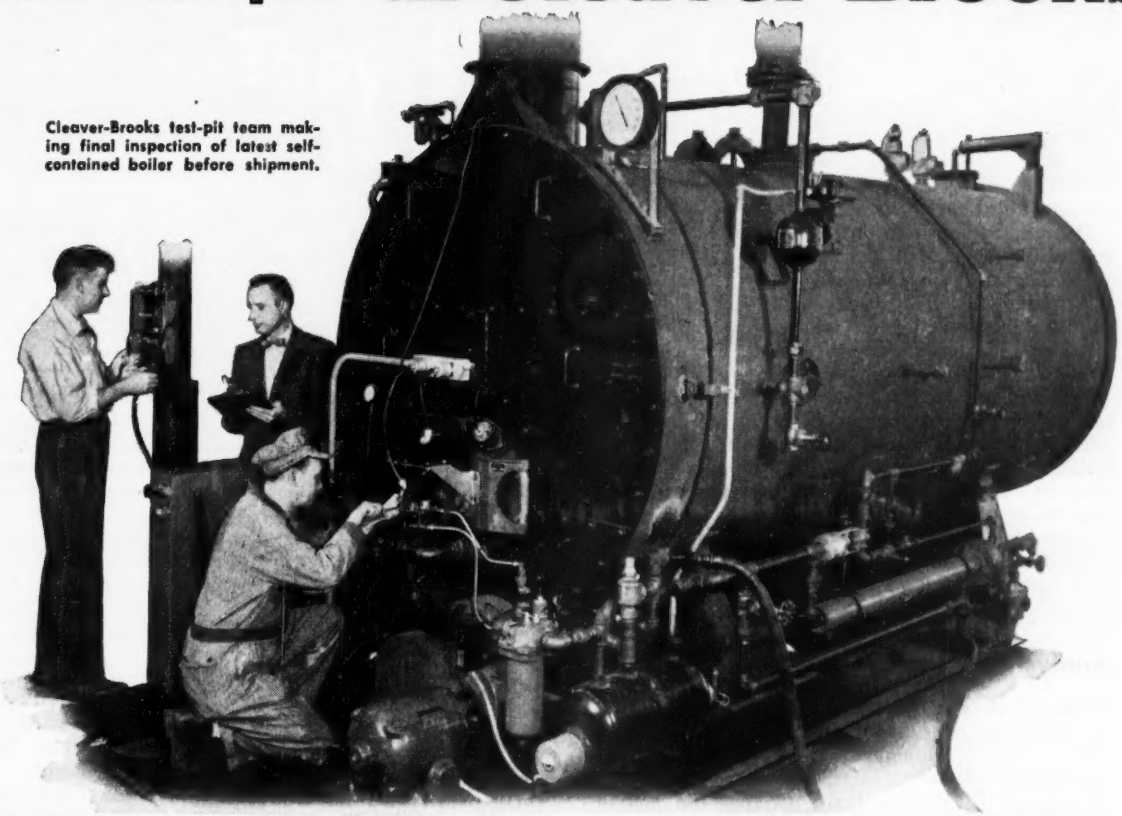
Q. What is the solera system for aging sherries?

A.—First of all, the Spaniards, who first started making sherry, refer to a solera as a specially arranged group of casks, each containing sherries in varying stages of maturity.

Now the solera method involves the systematic addition of a young sherry from one cask to an older one in another cask, along with the withdrawal of about a third of the older sherry to make room for the new. In this way, the new sherry has a chance to blend and "marry" with the old. Once started, a solera goes on producing a continuous flow of smooth, golden rich sherries.

---

their counterpart "Test-Pilots" have at Cleaver-Brooks



Cleaver-Brooks test-pit team making final inspection of latest self-contained boiler before shipment.

HIGH SCORES . . . on factory and on-job tests guarantee greatest return from boiler investment

When test pilots give the familiar "O.K." — that's the sign of proven performance. It's the same with boilers in the Cleaver-Brooks plant. Only after accurate, thorough inspection and testing under actual operating conditions do boilers get the final "O.K." from experienced test engineers. That's why you get guaranteed 80% efficiency from your Cleaver-Brooks boiler when firing with oil.

A record of this test is available to every buyer on request. In fact, you as a buyer, consultant, or contractor are invited to witness the actual test on your Cleaver-Brooks boiler before shipment.

And further, Cleaver-Brooks boilers are placed in operation at the job site by factory service engineers who check installation, train your operators and make complete and detailed field tests.

So, when you buy a boiler, insist on factory tests as well as field service tests by qualified engineers. There is no better way of insuring yourself of the very best value money can buy and the greatest return from your boiler investment. Look to Cleaver-Brooks, the leader in the "Packaged" Boiler field for two decades. Write today for latest Catalog AD-100.

Available for oil, gas and combination oil/gas firing.

CLEAVER-BROOKS COMPANY
Dept. A-354 E. Keefe Ave.
Milwaukee 12, Wisconsin, U.S.A.

Cleaver-Brooks
Originators of the Self-Contained Steam Boiler

BOILERS — STEAM OR HOT WATER — FOR HEATING AND PROCESSING IN SIZES FROM 15 TO 500 HP, 15 TO 250 PSI

For more information, use coupon on page 209.

Useful New Books & Government Publications

Nutrition Addition

BIOCHEMISTRY AND PHYSIOLOGY OF NUTRITION. VOL. II. *Edited by Geoffrey H. Bourne and George W. Kidder. Published by Academic Press Inc., 125 E. 23d St., New York 10. 1953. 641 pages; 6x9 in., cloth. Price:* $13.

The second of a two-volume series, this work presents a complete and up-to-date approach to the basic aspects of nutritional science.

Written by specialists in the field and edited by two of the foremost authorities on the educational facet of nutrition, the series placed special emphasis on the intimate enzymatic reactions, which make metabolism possible.

Indexed and illustrated as is its companion volume, Volume II presents chapters on intracellular localization by histochemical methods of enzymes and vitamins, structural changes in vitamin deficiency, microbiology of digestion, energetics and metabolism function, and many other vital points not covered in the first work.

Analysis Procedures

OFFICIAL AND TENTATIVE METHODS OF THE AMERICAN OIL CHEMISTS SOCIETY. *Second Edition. Edited and published by American Oil Chemists Society, 35 E. Wacker Drive, Chicago 1. 1953. 8x9¾ in. ring binder. Price:* $10.50.

First published in December 1946, and re-issued in June, 1952, book covers descriptions and detailed information covering the methods of analysis employed by the American Oil Chemists Society with all the latest revisions.

Intended for commercial evaluation and trading, the methods are contained in a strong, ring binder, allowing insertion of annual revisions.

Canadian Food Laws

CANADA'S FOOD AND DRUG LAWS. *By Robert E. Curran. Published by Commerce Clearing House, Inc., 214 N. Michigan Ave., Chicago 1, 1953. 1138 pages, 7x10 in., cloth. Price:* $19.50.

Of interest to everyone concerned with governmental regulation of food manufacture, book offers the exact texts of Canadian laws affecting food manufacture, with clear-cut explanations of their provisions and historical development.

Special attention is given Canada's present Food and Drug Act, with its emphasis on adulteration, misbranding, administration, and enforcement. Designed as a quick reference to Canadian food laws, this book is written by a legal authority with considerable experience in the field.

Water Conditioning

WHAT IS HARD WATER. *By Cornelia A. Taylor. Published by Water Conditioning Research Council, 111 W. Washington St., Chicago 2. 1953. 30 pages; 6¼ x 9 in., paper. Price* $1.75.

Reportedly the first authoritative non-commercial publication dealing with hard water, book deals with explanations of why water is hard, effects on cooking and human consumption, and the benefits of soft water.

Of particular interest to food processors are sections on ion-exchange and municipal hardness reduction, as well as information on the University of Illinois' study of hard water salts effects on canned food quality. Book is illustrated and contains a bibliography.

Government Publications

OPERATION AND REPAIR OF WATER FACILITIES IN CIVIL DEFENSE EMERGENCIES. Federal Civil Defense Administration, Technical Manual 13-2, 63 pages. 25 cents. Although designed for "Civil Defense", this document should be useful in other cases of emergency.

WHAT TO DO NOW ABOUT EMERGENCY SANITATION AT HOME. Federal Civil Defense Administration, Family Handbook 11-1, 28 pages. 15 cents. This document is particularly useful for plant employees in areas which might be subject to enemy attack.

THE INDUSTRIAL UTILITY OF PUBLIC WATER SUPPLIES IN THE MIDDLE ATLANTIC STATES, 1952. *U. S. Geological Survey Circular* 283. Covers public water supplies in 140 cities. Last of nine preliminary reports for entire country, giving data on population supplied, ownership, sources, and treatment of supplies, capacity of treatment plants, storage facilities for raw and finished water and chemical analyses. (These nine circulars will some day be available in a single volume, a revision of the 1932 Water-Supply Paper 658.)

STATISTICAL QUALITY CONTROL AND ACCEPTANCE SAMPLING. U. S. Army, Ordnance Corps, Inspection Handbook ORD-M 608-9, March 1952, 103 pages. $2.00. (Available as PB 111,164 from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C.; check payable to "Treasurer of the United States"). This report reviews some fundamentals governing sampling procedures.

ANIMAL FATS: WORLD PRODUCTION AND TRADE. U. S. Dept. of Agriculture, Foreign Agriculture Report No. 76, November 1953, 25 pages. Discusses the principal animal fats, giving production and trade by regions, both statistically and qualitatively.

ANIMAL AND VEGETABLE FATS AND OILS, 1952. Bureau of the Census, Facts for Industry, Series M17-1.02, 87 pages. 40 cents. This annual summary of statistics gives data for primary and secondary products for 1952 and the preceding three years, showing factory production and consumption, stocks, foreign trade, factory consumption by uses, and (for 1952) new data on fatty acids.

EFFECT OF SOIL APPLICATIONS OF INSECTICIDES ON THE GROWTH AND YIELD OF VEGETABLE CROPS. U. S. Dept. of Agriculture, Circular No. 926, 19 pages. 10 cents. Results obtained during three years of experimentation in California are presented in this Circular, prepared by the Bureau of Entomology and Plant Quarantine.

RATE, PLACEMENT, AND SOURCE OF PHOSPHORUS FERTILIZERS FOR POTATOES IN MAINE. *Bulletin* 506, *Sept.* 1952, 24 *pages.* 6x9 *in., paper.* EFFECT OF STORAGE AND RAILROAD TRANSIT ON POTATO DISEASES, INJURIES, AND SHRINKAGE. *Bulletin No.* 507. *Dec.* 1952. 28 *pages,* 6x9 *in., paper.* COMMERCIAL WASHING OF MAINE POTATOES, *Bulletin No.* 509, *Jan.* 1953. 19 *pages,* 6x9 *in., paper. Maine Agricultural Experiment Station, University of Maine, Orono, Maine*

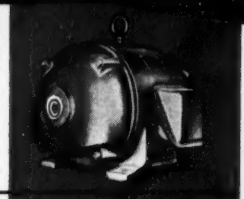
DIRECTIONS FOR INDUSTRIAL USE OF AEROSOLS. *USDA, Bureau of Entomology and Plant Quarantine publication E-835, Revised;* 4 pages. Discusses fundamental principles of aerosols for insect control, with experimental data and recommendations for use.

They Shed Splashes

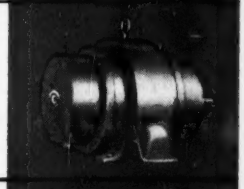
Like Water Off a Duck's Back

FOR INDOOR AND OUTDOOR USE—IN A WIDE RANGE OF TYPES AND SIZES

1 to 125 HP Squirrel Cage Induction 3 Phase *Splash Proof*

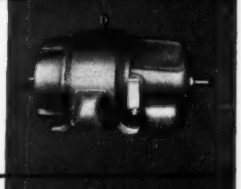


150 to 400 HP Squirrel Cage Induction 3 Phase *Splash Proof*

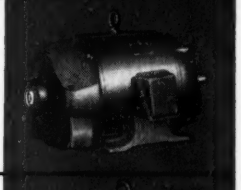


3 to 25 H. Slip Ring Induction 3 Phase *Splash Proof*

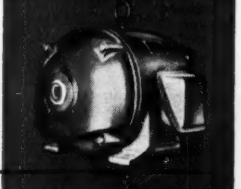
30 to 100 HP Slip Ring Induction 3 Phase *Splash Proof*



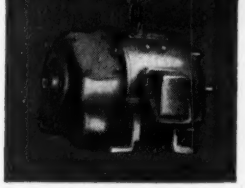
1 to 7½ HP Repulsion Start Induction Single Phase Brush Lifting *Splash Proof*



1 to 20 HP Capacitor Start Induction Single Phase *Splash Proof* — Capacitor mounted separately on 7½ HP and larger.



1 to 75 HP Direct Current *Splash Proof*



CE-758

Century

SPLASH PROOF MOTORS

Your production is protected by a Century Splash Proof frame that keeps all squirted, spilled or splashing liquids away from the vital working parts of the motor. These motors can be hosed down during your plant clean-up without the slightest damage.

Take a look at the many different types and sizes of Century Motors that are available in Splash Proof frames. Whatever your electric motor requirements, you can specify Century — correctly and with confidence.

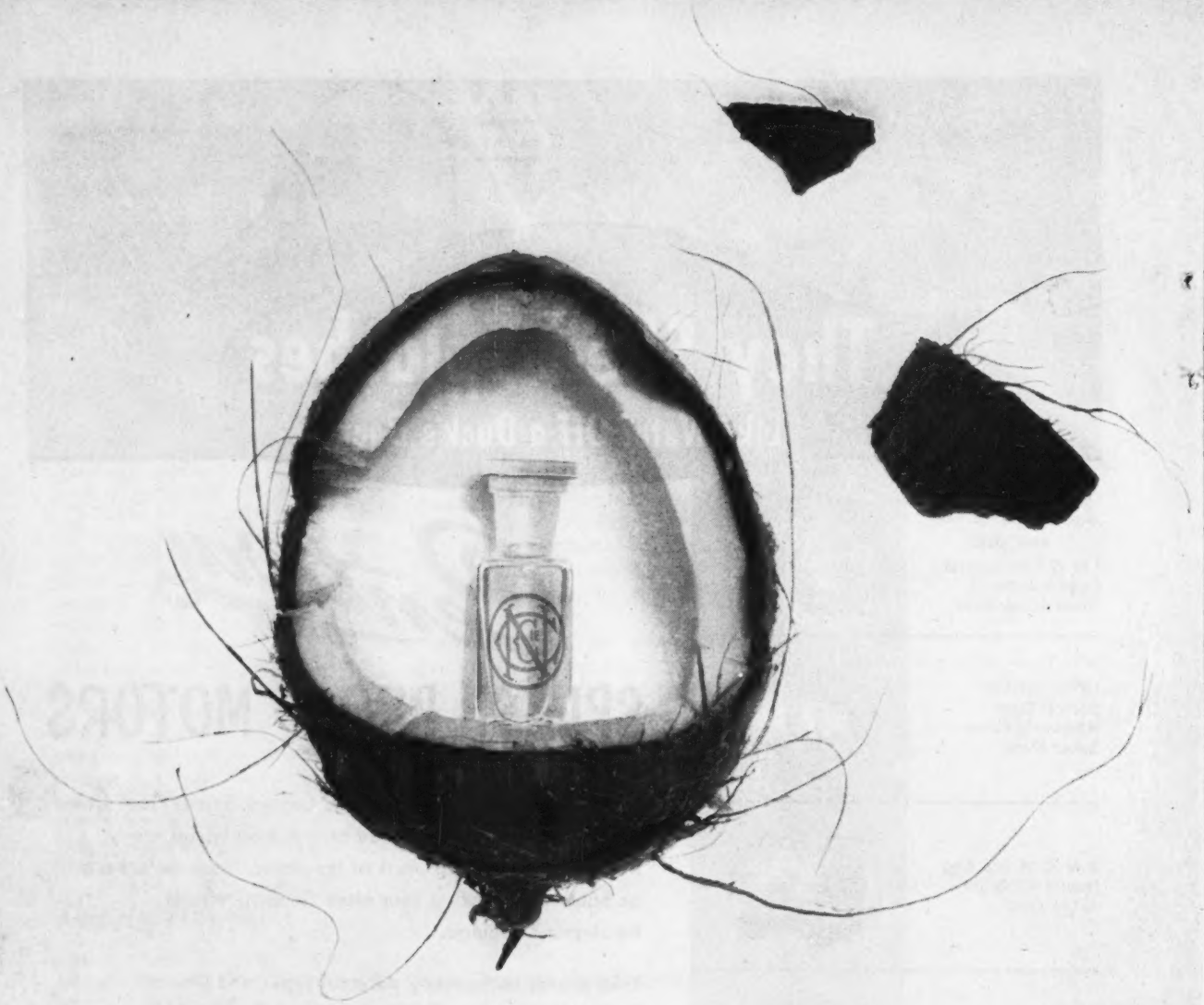
Century motors range in size from ⅛ to 400 horsepower — AC, single or polyphase or direct current — with drip proof — splash proof — dust proof — or explosion proof frames. Your nearby Century District Sales office, or a convenient authorized Century Distributor will be glad to give you full information.

Century C MOTORS

CENTURY ELECTRIC COMPANY
1806 Pine Street
St. Louis 3, Missouri

Offices and Stock Points in Principal Cities

For more information, use coupon on page 209.



IMITATION COCONUT BY FIRMENICH

gives your products the true and complete flavor of the meat of the coconut

Your coconut-flavored products enjoy the sweetness and freshness of a newly opened coconut itself when you fortify them with Coconut Flavor by Firmenich. For Firmenich has captured this delicious flavor . . . reconstructed it for you by original research . . . prepared it for you as a precise and potent flavor material . . . of the utmost purity and stability . . . to enhance the appeal of your cake mixes, ice-cream, candy, all the foods and confections that you flavor with coconut.

FIRMENICH & CIE
SUCCESSEURS DE
CHUIT NAEF & CIE
GENEVE SUISSE

CHICAGO OFFICE: 612 NORTH MICHIGAN AVENUE

FIRMENICH OF CANADA, LIMITED, 348 WALLACE AVENUE, TORONTO

GENEVA • PARIS • LONDON

FIRMENICH INCORPORATED

250 West 18th Street, New York 11

KEEPING UP WITH THE FIELD

Technical News • Washington Highlights • Economic Trends • Labor Developments

Plant Outlays Seen Holding

U. S. food companies plan to spend $841,000,000 for new plant and equipment in 1954, according to a preliminary check by McGraw-Hill's Department of Economics.

This figure is seen as repeating the Department of Commerce's estimate of actual food-company expenditures in 1953. Hence, the planning, as of today, aims neither up nor down from '53.

The '54 preliminary gives $11,683 millions for Total Manufacturing, including (besides Food) Steel, Autos, Machinery, Electrical Machinery, Transportation Equipment, Petroleum, Chemicals, Textiles, and Other Manufacturing. Since this overall sum runs 8% under the $12,690-million estimate of '53 outlays, Food is pictured as a front-runner.

Honey in Baking

Bread, cakes, cookies, and other baked goods are improved when part of sugar in formula is replaced by honey, according to John A. Johnson, researcher in flour and feed milling at Kansas State College.

In a 3-yr. study, Johnson found that honey bettered the color, flavor, and texture, increased moisture retention, and lengthened shelf life. Effect was especially noticeable in fruit cake. He has drawn up tentative specifications of most acceptable floral types of honey and best amounts to use.

Low-Butterfat Spread

An interesting approach to the butter vs. margarine problem is seen in the announcement that a "dairy spread" containing 58% butterfat and nonfat dry milk will soon be introduced in Des Moines, Iowa.

Made by Dairy Foods Co., Nashua, Iowa, the product is expected to sell for about 20¢ less per lb. than butter.

Mex-Food Makers Band

Now under organization is a national group of processors making Mexican type foods—chili, chili-flavored beans, chili pepper products, enchiladas, fried beans, fried corn products, Spanish rice, tamales, tortillas.

Charter gathering of the group is scheduled Feb. 17-18 at the Roosevelt Hotel, New Orleans. In an initial promotion meeting in Dallas, 28 representatives of interested firms tentatively took the name "Mexican-Foods Institute" and elected Franklin R. Ullrey as secretary. He now has headquarters at 2817 LaSalle-Wacker Bldg., 221 N. LaSalle St., Chicago.

Chairman of the organizing committee is William Coughlen, Walker's Austex Chili Co., Austin, Tex. Committee vice-chairmen are E. George Lambrecht, Gentry, Los Angeles, and Edward J. Stegner, Stegner Food Products, Cincinnati.

Plans call for inclusion of representatives of supply firms as associate members.

On to Better Quality Fish

First commercial quantities of round, frozen fish were recently unloaded from the trawler *Delaware* at Boston Fish Pier by researchers of Fish & Wildlife Service.

Freezing at sea immediately after catching appears to offer the best method of maintaining quality during extended trawler voyages.

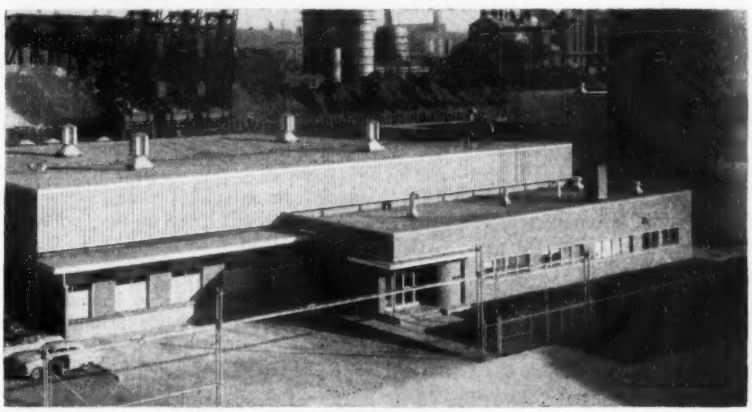
Food Industries Division Added by Commerce

One of 25 divisions recently set up in the Commerce Department's Business & Defense Services Administration is the Food Industries Division.

Top personnel pattern is similar to that for all divisions of BDSA, in that a permanent deputy director with Civil Service status keeps things running, while temporary "directors" on loan from industry bring in fresh points of view and new contacts with industry on a periodic rotation basis.

Jacob M. Schaeffer is the first deputy director, having transferred from USDA a few months ago. He has had a long background in Bureau of Animal Industry, War Food Administration, and Production & Marketing Administration. Initial industry director had not yet been named at this writing.

Staff of the Division now numbers six, including some who have been in the Department previously and others who are newcomers. These include (alphabetic order): C. V. Danielson, Charles Francis, W. W. Hubbell, A. L. Morel, Mrs. A. N. Taylor, and Earl



Cleveland's New Cane-Sugar "Relay" Plant

Speedy delivery of cane sugar in the Cleveland area—both in packaged and bulk form—is assured with completion of this new $1,500,000 facility by The National Sugar Refining Co. Reportedly, it is the first such inland packaging and bulk-handling plant.

Using 100,000-lb.-capacity bulk RR cars, New York and Philadelphia refineries will ship sugar to this new Cleveland center, from where it will be distributed to large commercial users both by truck and rail.

Designed by The Austin Co., plant is of brick and aluminum-siding construction, and it is flanked by a 132-ft.-high, 6,000,000-lb.-capacity concrete silo (partly visible at right). Unloading of sugar from RR cars into silo will be via a system of enclosed screw conveyors and bucket elevators. And other enclosed screws will move it from silo to packagers.

To keep product in quality condition, the conveyor-elevator system will periodically shift the sugar in the silo. Also, warm, dry air will be circulated through silo's double walls.

IFT Honors Newton

To Dr. Roy Newton (left), research director of Swift & Co., goes honorary gavel tokening his past presidency of Institute of Food Technologists. Tendering memento mallet is George Brissey, chairman, Chicago Section. Still with us today, reminisced Dr. Newton, are many fundamental problems that were soul-searched by IFT's founding fathers—such as the role of other sciences in food technology. And, he added, another 20 years undoubtedly must pass before IFT will have achieved its full meaning.

Winger. No individual areas of commodity responsibility have been published. Headquarters of the Division will be found in area of Room 4056, Commerce building.

Only three annual surveys are now being made by Commerce in the food field. Dealing with confectionery, salad dressings, and preserves, these are on an industry-financed basis, with costs ranging from $2,000 to $5,000 per year each. There is some possibility that additional surveys will be made and that the Industry Report series (dropped in 1950) will be re-established.

There is speculation in Washington as to where Commerce and Agriculture Departments' jurisdictions meet. Major reorganization of latter Department, now under way, means an answer from that source is not likely soon. Best current guess is that Agriculture will turn its food problems over to Commerce at the point of first processing. This would be in line with Hoover Commission reports issued in 1949. Close cooperation between the Departments is predicted.

Sees Protein Conversions As Dairy Competition

Stiff competition is shaping up against the dairy field from the direction of the chemical industry, with the battle heralded by progress achieved in converting important low-cost foods into high-quality protein sources by adding amino acids.

So declares Milton E. Parker, director of the food engineering department of Illinois Institute of Technology, Chicago.

Writing in the November *Technology Review*, Prof. Parker cites lysine, methionine, threonine, and tryptophane as the four aminos most needed to improve human diets. "In areas where bread and other foods derived from wheat are important staples," he states, "substantial improvement in protein nutrition possibly can be realized by fortification with lysine alone."

The prediction gets added weight now that DuPont has released to "free license" its patent rights on the use of lysine. Already synthesizing lysine, DuPont is making experimental quantities available to processors.

Combinations of the four amino acids can enhance protein nutritional values of foods based on rice, potatoes, and legumes, says Prof. Parker. He adds: "In many instances it is not unrealistic to predict that effective supplies of dietary protein can be increased markedly through mere amino acid supplementation, provided the basic economic problems of combining or adding these four amino acids can be solved."

New Award to Prescott

First recipient of the new annual Service Award of the 49ers, organization serving the Canning Machinery & Supplies Assn., will be Dr. Samuel Cate Prescott, professor emeritus of M.I.T. and authority on food preservation. Plaque (above) and a scroll will be presented to the noted researcher by Robert A. Sindall, Jr., 49er president, at a special Atlantic City meeting, Jan. 22 during the canners' show. Cited in the award are Dr. Prescott's outstanding achievements and service to the canning and allied fields, notably his work in applying the principles of bacteriology to plant operations, resulting in practical methods of food preservation and sterilization. Dr. Prescott continues as a consultant to the research laboratories of the National Canners Assn.

Briefly . . .

• STRIKING rise in food quality through continuing advances in production, processing, and distribution, was pinpointed by William J. Scarlett, food industry manager, Industrial Div. of Minneapolis-Honeywell, at the recent Food Editors Conference in Chicago. As compared with prewar, the average diet, he declared, now contains less fat and 6½% more proteins, 10% more carbohydrates, 17% more calcium, 20% more iron, plus an average of 25% more vitamins.

• EYE on enterprise has paid handsomely for Quaker Oats Co. Some 25% of its current sales are credited to items either newly introduced or newly added since 1940. Among them: Cake mixes, prepared flours, pet foods. Of company's 21 domestic plants, 14 are post-1940.

• FROZEN concentrated lemonade will now come from Florida (Minute Maid and Libby, McNeill & Libby), augmenting earlier output from California and Arizona. The new eastern promotion is seen lifting production of the product from '53's 7 million cases to some 10 million this year.

•DAIRY engineering again will be targeted at Michigan State College, East Lansing, Mar. 3-4. Big success of the initial get-together early last year brought demands conference be run annually.

•RETIREMENT of Dr. Berton S. Clark, scientific director of American Can Co.'s research and technical department, brings numerous eulogies of this pioneer's fruitful career. Now president of the Institute of Food Technologists, Dr. Clark has played a leading role in food and container research. Particularly noted is his work in development of corrosion-resistant tin plate for cans and the hydrogen evolution test for gaging tin plate performance.

• NEW PROCESS for making flour-like fish-meal food of high protein value has been developed by Viobin Corp., Monticello, Ill. Reputedly low-cost operation is based on solvent extraction and dehydration principle.

• EVER-POPULAR Annual Food Processors School of Oregon State College is about to get under way: Closing Machine & Double Seaming School, 2 weeks starting Jan. 25 and 2 weeks beginning Feb. 8 (American Can Co., and Continental Can Co., respectively). Also, 1 week of processing instruction, starting Feb. 3.

• EVENING classes in food engineering will be offered for the first time at Illinois Institute of Technology, Chicago, beginning Feb. 15.

USDA Grade Standards

Recent actions by Production & Marketing Administration of USDA on U. S. Grade Standards and related activities include the following:

Frozen concentrate for lemonade, new, p. 7292, Nov. 18 *Federal Register*, effective Dec. 18 (correction on p. 7670, Dec. 3 *Federal Register*).

Grain Standards, appeal inspection fees, increase proposed, p. 7495, Nov. 24 *Federal Register*, written comments received until Dec. 24.

Processed Fruits and Vegetables, etc. (74 separate commodities), grading regulations recodified without substantive change, pages 7904 to 8080, Dec. 9 *Federal Register*, effective Dec. 9. (This issue, priced at 35¢, gives complete text of most of processed fruit and vegetable grade standards.)

Cucumber pickles, revised, proposed, time for written comments extended from Dec. 14 to Jan. 15 by notice on p. 8121, Dec. 10 *Federal Register*. (Original proposal appeared on p. 6566, Oct. 15 *Federal Register*.)

Hors d'Oeuvres

▶ Colorado health official, Martin D. Baum, banned color pictures on luncheon meat packages. He says the pictures look better than the product.—But, Mr. Baum, they don't taste nearly so good.

▶ The meat industry's profit is a measly three-fifths of a cent on the sales dollar. Packers have as much right to squeal as the pigs.

▶ Annual world sugar production—some 35 million tons—would fill a box as big as a football field and 6 miles high.—Anyone have an oversize lift truck?

▶ Secretary Benson is looking for an answer to the surplus milk problem. Why not promote beautifying milk baths with the slogan: "Which Eleanor had the Elsie?"

▶ Potatoes also are in worrisome surplus. Will some nutritionist please prove that, for real food value, the eyes have it?

▶ Cloves were known in the Orient two centuries BC. They perfumed the breath of imperial court officers in the presence of their sovereign.—Kiss-sweetening chlorophyll came 22 centuries too late.

▶ Industrial TV displays meat in a butcher-shop cooler. Might better use it to show the butcher's thumb at the scales. And why not take visitors through food plants via TV—in a nice, comfortable reception room?

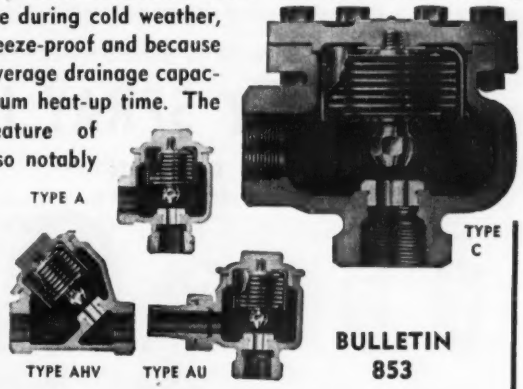
▶ Sweet potatoes contain carotene, good for night-blindness. Eat 'em before going to the movies, then you can spot a seat in which to enjoy your popcorn.

NICHOLSON MAKES

Freeze-Proof Steam Traps

for every Plant Use

Because they drain completely when cold, these four types of Nicholson steam traps are positively freeze-proof. Can be freely installed outdoors. Universally recommended for use in lines which need not be in continuous use during cold weather, because they are freeze-proof and because their 2 to 6 times average drainage capacity results in minimum heat-up time. The non-air-binding feature of Nicholson traps also notably facilitates heat transfer in severe weather. Types for every plant use. Sizes ¼" to 2"; pressures to 250 lbs.



BULLETIN 853

193 OREGON ST., WILKES-BARRE, PA.

W. H. NICHOLSON & CO.

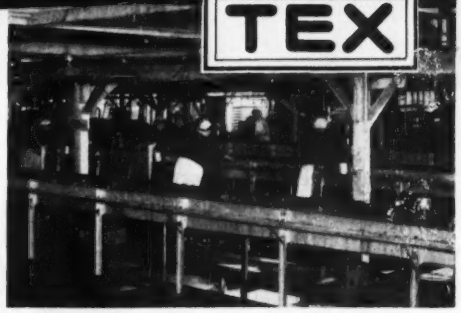
TRAPS · VALVES · FLOATS

CHOOSE THE RIGHT conveyor belting FOR THE JOB!

TON TEX

...and you'll reduce production costs

The *right* belting for conveying food products speeds production, cuts costs, lasts longer. Ton-Tex will do that for you. Plies of tightly woven cotton duck are impregnated with compounds under pressure to produce the belts that will meet your specific needs. Let us help you select the *right* belt for your conveyor jobs.



Troubled by moisture, acids, oils, heat?

For 25 years Ton-Tex has furnished food processors and canners with conveyor belts specially treated to resist these conditions. They impart no odor or taste to products handled. They can be cleaned like new without injury to belting. Processors *know* Ton-Tex lasts longer, actually costs less.

TON-TEX CORPORATION, GRAND RAPIDS 2, MICH.

31 COLUMBUS AVENUE, ENGLEWOOD, NEW JERSEY

759 W. SAN CARLOS STREET, SAN JOSE 26, CALIFORNIA

TON-TEX CONVEYOR AND TRANSMISSION BELTING

For more information, use coupon on page 209.

for
• SPRAYING • WASHING • RINSING • COOLING • AIR CONDITIONING

Get the most out of your Spraying Equipment with minimum power . . . with efficient spraying.

Use Yarway Nozzles. No internal vanes or other restrictions to clog or hinder flow. Two types—Yarway Involute-type producing a fine hollow spray with minimum energy loss, and Yarway Fan-type producing a flat fan-shaped spray with time-saving slicing action for cleaning.

Wide range of standard sizes and capacities. Cast or machined from solid bar stock.

Thousands in use. Write for Bulletin N-616.

YARWAY SPRAY NOZZLES

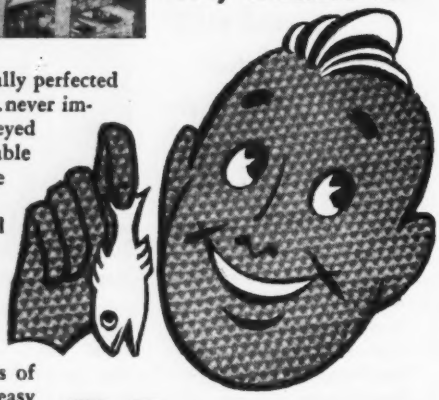
YARNALL-WARING COMPANY
127 Mermaid Avenue, Philadelphia 18, Pa.

SUPRENE BELTING

Helps Food Stay Wholesome

Suprene Belting has been carefully perfected to help foods stay wholesome...never imparts any taste or odor to conveyed products. Made of tough, durable duck and impregnated with the exclusive Victor "Neoprene" compound, Suprene has proved of inestimable value in the packing, processing and manufacture of food products.

Suprene Belting is not only waterproof, but is also highly resistant to the injurious effects of fats, greases and fruit acids. It is easy to wash with steam or hot water. Specify Suprene Belting for all your conveying needs and be sure of safe, sanitary conveyance for years. Send for bulletin 20—it's free.



Victor Rubatex & Textile Belting Co.
53 Park Place, New York 7 · 300 W. Hubbard Street, Chicago 10
Factory, Easton, Pa.

6456

FDA Food Standards

Status of food standards activities of Food & Drug Administration at the turn of the year is reviewed below:

Pending Legislation: Several bills are pending in Congress offering proposed amendments of the FD&C Act of 1938. Those which would change the present status of food standards activities in FDA in an important way include the following.

Simplification of food standardizing procedures would be accomplished by passage of H. R. 6434 (introduced as H. R. 5055) by Rep. Hale (R., Me.). This bill has passed the House and early passage in the Senate is expected.

Regulation of pesticide residues in foods has been proposed in H. R. 4277 by Rep. Miller (R., Neb.). Hearings on this bill have been held, with several differences of opinion stated by FDA and the bill's advocates. Further hearings may be held before the bill is reported out by the House Committee on Interstate & Foreign Commerce. Passage of this bill by Congress in 1954 is questionable.

Re Chemical Additives

Regulation of chemical additives in foods has been proposed in two bills, H. R. 2245 by Rep. Delaney (D., N. Y.) and H. R. 4901 by Rep. Miller (R., Neb). Hearings on these bills were scheduled once during the last session of Congress but were postponed until the 1954 session. This is a highly controversial subject, making the chance of Congressional passage of either of these bills unlikely during the coming session.

Outlawing of the imitation of standardized foods is aim of H. R. 2739, introduced by Rep. O'Hara (R., Minn.). No hearing on this bill has yet been held, but its passage during 1954 is a possibility.

Simplification of labeling of export foods has been proposed in H. R. 4001 by Rep. Van Zandt (R., Pa.) and H. R. 6550 by Rep. Wolverton (R., N. J.). These would permit export food labeling to comply only with the laws of the country of destination, if such labeling differed from or were simpler than required for domestic marketing. No hearings have been held on these bills, but passage of

Correction

In the November FE article, "Pace-Setting 2-in-1 Plant," the pneumatic system for moving flour correctly should have been credited (line 14, 3rd column, p. 74) as having been developed by Baker Perkins Inc., Saginaw, Mich.

one of them in 1954 is also a possibility.

Other bills affecting FDA deal in general with only one commodity or are unrelated to food standardizing activities.

Executive Procedure: Some progress was made during 1953 by the President's Conference on Administrative Procedure. This group was named to consider methods whereby economy and efficiency could be increased in court trials and hearings conducted by Government agencies. A number of general principles applicable to all departments and agencies are now being circulated for review.

The Conference will assemble these later for appropriate recommendation to the President. And eventually an Executive Order may be issued to put some or all of the recommendations into effect. In the meantime, of course, the Department of Health, Education & Welfare has lost none of its original discretionary power to amend its own hearing procedures within certain limits. For example, passage of the Hale Bill (cited above) would occasion immediate simplification of food standardizing procedures by FDA.

Future Hearings: 1. *Coal-tar colors*, amendment to remove from the list three colors that have been used in the past: FD&C Orange No. 1, FD&C Orange No. 2, and FD&C Red No. 32. Although no evidence of human injury by these colors has been found, pharmacologic evaluation of them by FDA has apparently raised some question as to the desirability of their continued use. Public hearing is expected this month, with prior formal announcement scheduled to appear in the *Federal Register*.

2. *Catsup*, amendment, standard of identity. National Canners Assn. has requested addition of corn syrup as an optional ingredient. Department of HEW has announced that the hearing will be scheduled "after completion of other hearings, plans for which were made some time ago".

3. *Canned tuna*, new, standards of identity and fill. Hearing expected during 1954, but no date set yet.

4. *Process Cheese food*, amendment (requested by manufacturers in early 1951), standard of identity; skim milk cheese proposed as optional ingredient. Hearing expected soon, but date not yet set. Hearing will probably include discussion of anti-mycotic agents intentional and incidental.

5. *Salad dressing*, rehearing (ordered Mar. 1951 by Third Circuit Court of Appeals), standard of identity; "skim milk and milk products" proposed as optional ingredients. FDA getting data. Hearing date not set.

Tentative Orders Awaited: 1. *Residue tolerances*, on fresh fruits and vegetables, new. Expected soon; hearing adjourned Sept. 1950; briefs filed Dec. 1950.

2. *Canned pineapple and canned pineapple juice*, new, standards of identity, quality, and fill. Expected momentarily; hearing adjourned in Apr. 1952; briefs filed in Sept. 1952.

3. *Ice cream*, new, standard of identity. Not expected soon; hearing adjourned in Dec. 1952; briefs filed in Sept. 1953.

Final Orders Awaited: 1. *Cacao products*, amendment, standard of identity. Expected soon; tentative order, published on Nov. 3, elicited no exceptions. Therefore no change from tentative order is expected, except for correction of a typographic error.

2. *Frozen fruits*, new, standards of identity and fill. Expected momentarily; tentative order published in Oct. 1950; exceptions filed in Jan. 1951.

3. *Pacific oysters*, amendment, standard of identity. Expected soon; tentative order published on p. 7323, Nov. 19 *Federal Register*, without change from original proposal; exceptions received until Dec. 19.

4. *Dietary foods*, labeling regulations of low-sodium foods, amendment. Hearing took but 2 days (mid-December) for medical and dietetic witnesses to support FDA proposal that label show actual sodium content (mm./100g.). Present practice usually refers to salt content, but since some foods have ingredients contributing sodium from other sources, old labeling has been held inconsistent. Jan. 18 was set as date by which briefs should be submitted.

Standards Completed: None since canned mushrooms amendment (FE Oct. '52, p. 207).

"Poly"-Protected Bananas

Gas-permeable polyethylene tubing is now slipped over stems of bananas, soon after cutting them from trees, for protection against scarring and bruising during handling and shipping. This Visking tubing was selected, according to J. N. Kelley, United Fruit Co. executive, after extensive testing of other various sheetings.

Schedule of Events

January '54

14–15—Western Frozen Food Processors Assn.; Hotel Casa Del Rey, Santa Cruz, Calif.

15—National Soft Wheat Millers Assn.; Brown Hotel, Louisville, Ky.

18–21—Canadian Food Processors Assn.; annual convention; Alpine Inn, Ste. Marguerite, P. Q., Canada.

19–22—National American Wholesale Grocers Assn.; Atlantic City, N. J.

23–27—National Canners Assn., National Food Brokers, Canning Machinery & Supplies Assn., overall convention and annual meetings; Atlantic City, N. J.

25–27—National Dairy Council, winter conference, Peabody Hotel, Memphis, Tenn.

25–28—National Potato Chip Institute, annual conference and exhibition; Netherland Plaza Hotel, Cincinnati.

25–28—Plant Maintenance-Engineering Show & Conference; International Amphitheatre (show) and Conrad Hilton Hotel (conference), Chicago.

31–F3—National Assn. of Frozen Food Packers, national convention; Commodore Hotel, New York City.

February

13–15—Institute of American Poultry Industries, Silver Anniversary Fact Finding Conference; Kansas City, Mo.

21–24—National Wholesale Frozen Food Distributors' Assn.; New York City.

Incentives Replace Bonus

—*Continued from page 78*

On the other hand, overfill represented time and effort not contributing to bonus earnings, since most of the overfill became lost to waste.

As a result of supplying convincing evidence to workers, coupled with adequate demonstration of loss due to over- or under-fill, the variation in the contents of the boxes is now very slight. In fact, there is negligible deviation in total shift output as measured by tote boxes and by actual final weight of all packages.

How'm I Doin'

Once incentive production is under way and workers' incomes are materially higher, wouldn't it seem logical that high-level output would be assured? Due to the element of human nature, performance is never assured, never completely uniform.

Merely making more money isn't enough for the individual. To remain efficient and maintain a high level of output, the individual must know "how'm I doin' ". Equally important is keeping supervisors constantly informed on how each worker performs. Daily records provide exact worker performance data published daily.

For most individual-incentive work-

For Eye-Level Readings...

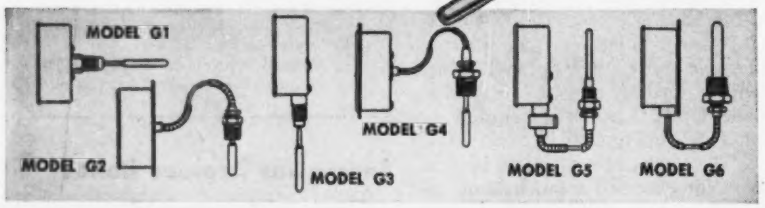
AUTO-LITE

TEMPERATURE INDICATORS

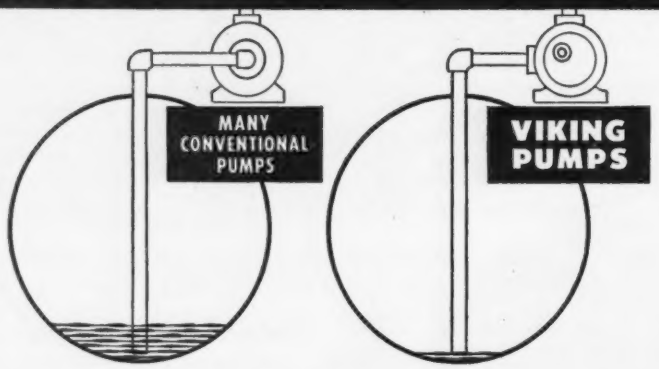
- Precision-built indicators provide accurate temperature readings.
- Low-cost protection . . . due to large, specialized production.
- Wide selection of dial ranges to meet specific requirements.
- Choice of stock types available as shown.
- Send for new catalog, describing many thermometer styles.

THE ELECTRIC AUTO-LITE COMPANY
INSTRUMENT AND GAUGE DIVISION
TOLEDO 1, OHIO
NEW YORK • CHICAGO • SARNIA, ONTARIO

MODEL "G"
Select the type that is best for your purpose. 3½" dial; evenly calibrated scales. From $18.



GETTING TO THE BOTTOM OF THINGS



The difference to you between profit and loss can depend upon the simple, positive action of Viking Rotary Pumps. Their fast, thorough stripping action can mean that you get all you pay for when emptying barrels, tanks and other containers instead of leaving a part of each load. Where many other pumps fail, efficient stripping is possible with Vikings because of the suction lift created by our famous Viking "gear-within-a-gear" pumping principle.

VIKING
AN HONORED NAME IN PUMPING

Whether the liquid you want to pump is thick or thin, you will pump more . . . faster with a Viking. What is your pumping problem? Send it along today and ask for bulletin 54SE.

See Our Catalog in SWEETS

VIKING PUMP COMPANY
CEDAR FALLS, IOWA

ers there is a psychological need to know, each day: "How good was I yesterday? Did I beat my own record? How do I stack up with the others?" Workers even like to know at what time during the day they accomplished most, or when their rate of production dipped down. Then they can see why they failed to meet standards.

So Seabrook keeps records of each employee, and it supplies to all incentive workers every day the individually itemized results of their lines' production the day before. Though extra work is required in preparing these detailed reports, the effort brings compensation—workers audit the reports. Thus errors are at once detected, misunderstandings avoided, and differences immediately adjusted.

Not only are production-performance forms made out in detail, but they are so arranged that workers can duplicate and check the company's calculations. The heading of a column of figures on the report form explains the tabulations. Also, each column or base figure is numbered or lettered. Thus by indicating beneath column heading designations like these—1 x 5 and 4 ÷ C—workers can check company figures to satisfy themselves on the results of their previous day's performance.

Hourly Station Rotation

If an individual incentive plan is to operate with full efficiency, never must any worker be given any grounds for presuming partiality. Obviously, the first station on a line provides largest volume of material, and greatest range of selection. It is the location most coveted by the individual incentive worker. Accordingly each station is preferable to the one following.

For this reason, the location of each worker who packages and weighs is shifted everyday. Last in line goes to the first station, first-station occupant moves to second, and so forth.

In addition to keeping peace and harmony, there is another advantage to station rotation. This shifting provides a guide to supervisors by indicating the most efficient workers.

At the broccoli-sorting stations where pieces are selected and aligned in tote boxes, workers on each side of the conveyor belt are divided into groups of four. In the first groups are the most efficient producers. These rotate location every hour, and the change is almost to the exact second. Worker in No. 4 position, who usually calls the time, doesn't want to lose time in the advantageous location.

Those in the second group of four performing the sorting operation are usually lower in bonus-earnings than

workers in the first group—partly because they are less efficient, partly because station location limits production. But even in this handicapped location, an efficient worker will outdistance teammates, providing the supervisor with necessary information on which to base promotions.

Even when production soars and incomes of workers are at top level, sailing is not always smooth. Among the most productive individual-incentive workers are some of the most marked individualists.

Though the most satisfactory individual-incentive workers are aggressive and indivualistic, they are quite normal people. As a group, they are the above-average workers, keen mentally, willing, and efficient. Nevertheless, individual incentive workers present unusual problems. They can be likened to sensitive precision instruments that require skilled technicians to keep in adjustment.

Difficult situations do arise. Unusual behavior and lost efficiency in these fast-working individuals often may be accounted for by imagined or very petty grievances. Indications that everything is not O.K. with the individual must quickly be recognized, and the irritating situation immediately smoothed away—with tact.

Here is evidence, in plenty, of the need for thoroughness in the selection of the supervisors. Also indicated is the need for basic training in the fundamentals of human relations to stimulate perception, tact, and diplomacy in all of those whose work brings them in contact with employees.

End (*Resume reading on page 31*)

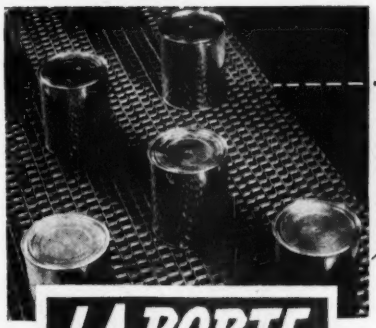
Specialty Foods

—*Continued from page 43*

devices. Conical in shape and having corrugated surfaces, these units knead the dough until it is uniform in texture, smooth, and stiff. This takes about 15 min. The dough is then cut into sections.

Each dough piece is now transferred to the sheeter, which consists of a pair of adjustable, stainless steel rolls. Here, the dough is reduced to a ⅛-in.-thick sheet, is wound on a spool, and is fed to one of the ravioli machines.

Here, the dough sheet first passes between a pair of stainless steel rolls that further reduce it to the desired thickness. A 60- to 70-stroke-per-minute reciprocating type cutting head next stamps out eight rectangular dough pieces per stroke. Then eight vertical plungers force meat or cheese filling from a pair of 10-lb.-capacity



it's FLEXIBLE!..

assures perfectly flat surface for containers empty or filled*

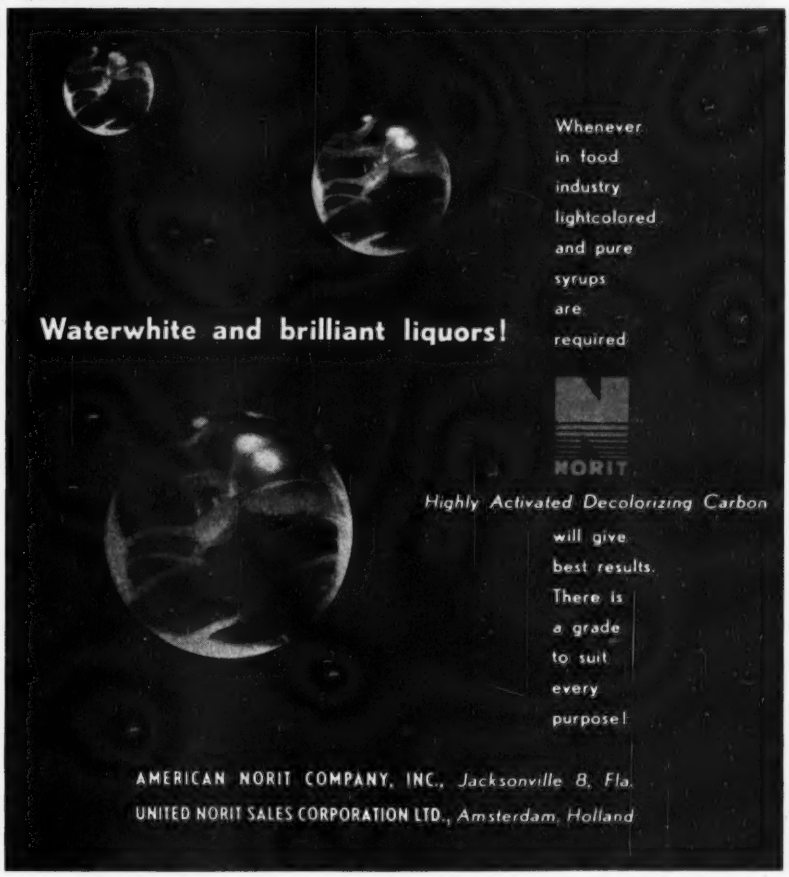
LA PORTE FLEXIBLE STEEL CONVEYOR BELTING

* That's right! By assuring a firm grip on the friction drum, La Porte's Flexibility Feature eliminates all creep, weave and jump, preventing needless wear on pulley stands . . . provides perfectly flat surface for containers, empty or filled, and makes possible a continuous smooth flow of products in process *from bin to shipper!*

And husky La Porte Conveyor Belting is adaptable to any process. Whatever your food handling operation—canning, freezing, pickling, dehydrating—you'll find that LaPorte does the job faster, better, and with less maintenance worries. FLEXIBLE STEEL MESH CONSTRUCTION withstands heaviest loading impacts . . . and also permits circulation of air and liquids around products in process. Easier to clean. Highly resistant to heat and cold. So, for *maximum* service with *minimum* servicing, better specify LaPorte Belting!

Write TODAY for Literature and Prices—no obligation

LA PORTE MAT & MFG. CO.
BOX 124 LA PORTE, INDIANA


Waterwhite and brilliant liquors!
Whenever in food industry lightcolored and pure syrups are required
NORIT
Highly Activated Decolorizing Carbon will give best results. There is a grade to suit every purpose!
AMERICAN NORIT COMPANY, INC., Jacksonville 8, Fla.
UNITED NORIT SALES CORPORATION LTD., Amsterdam, Holland

For more information, use coupon on page 209.

SAYS **STOP** TO SOLIDS

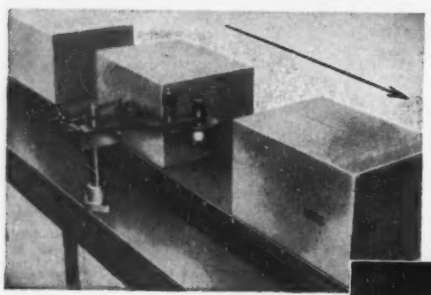
Yarway Fine Screen Strainers prevent rust, scale and dirt from clogging mechanical equipment. Screens of woven Monel wire, bodies and screen caps cadmium plated. Made in 10 sizes—¼ to 3". Sold by over 200 industrial distributors. Bulletin S-203.

YARWAY STRAINERS

YARNALL-WARING CO., 127 Mermaid Ave., Philadelphia 18, Pa.

For quicker warehouse stacking, quicker identification...

MARK ALL 4 SIDES OF CASES AUTOMATICALLY...*in a single pass*



New ROLACODER units attach to conveyor or sealer . . . imprint code-dates, lot numbers on all 4 panels of cases simultaneously . . . *without requiring cases to be turned.*

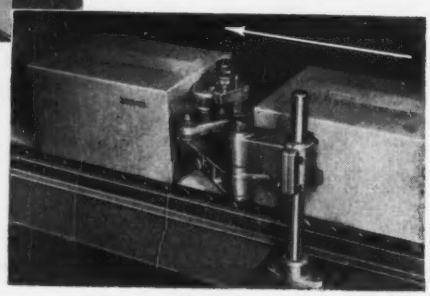
ROLACODER 500

imprints *front* and one *side* panel simultaneously

ROLACODER 200

imprints *rear* and other *side* panel simultaneously

Write for new descriptive sheet ROL-1



Gottscho

ADOLPH GOTTSCHO, INC.

Machines to Mark Whatever You Make

Hillside 5, N. J.

50 Years of Leadership

cartridge-type metal holders, through circular dies, and onto the center of each belt-conveyed piece of dough. Each piece of dough is now folded and sealed as it drops through a pair of rolls and onto bottom-perforated trays riding on a chain-belt conveyor. Trays are then loaded, 10 to a rack.

If the ravioli is to be frozen, it is placed in a colander and parboiled several minutes in a steam-jacketed, stainless steel kettle. On the other hand, if it is to be canned, the parboiling is omitted and cooking is accomplished in retorts.

Meat or cheese fillings are prepared in a 60-qt., vertical-type bowl mixer. The meat filling is cooked for about 1 hr. in an oven holding a dozen 52-lb.-capacity trays. Meat filling is then cooled and finely ground.

Making Lasagne

That extra-special macaroni dish—lasagne—is principally prepared by hand. Girls arrange layers of parboiled, wide flat-type macaroni, meat sauce, and ricotta, mozzarella, and Parmesan cheeses in 3x12x18-in. stainless steel trays, which are racked, then transferred to the quick-freezer.

Frozen lasagne is next removed from trays, and each large block is cut into 18 smaller ones by a band saw. A small block of lasagne is packed into a glassine-lined carton and filled to 1-lb. net weight with meat sauce, using a single-spout, volumetric filler. Cartons are finally machine-wrapped with printed waxed paper and stored, ready for shipment, in a freezer room.

Grated Parmesan cheese is manufactured by soaking 24 wax-coated "wheels" of cheese (20 lb. each) for about 10 min. in a metal vat containing 120-130 deg. F. water. Melted wax is then scraped off each wheel, which is then loaded onto a stainless-steel inclined chute feeding a specially designed, all-stainless grating machine. At the bottom of the chute, an 18-in. dia. rotating stainless wheel, with rows of evenly spaced ¼-in. teeth, grates a wheel of cheese in about 2 min.

Grated cheese now drops onto trays, which are loaded 18 to a rack (or about 30 lb. of cheese). The cheese is dried overnight to an 18%-moisture content. Cheese is then filled by a single-spout filler into glass jars (net weight: 1¼ or 2½ oz.), which after racking in groups of 24 are sealed in a vacuum chamber (25 in.).

Sauce Lines

In making the three sauces, No. 10 cans of tomato paste are machine-opened and emptied into a 75-gal.

stainless steel kettle. Empty cans are washed free of remaining paste by inverting them over an upturned water faucet, installed directly over a second kettle. Tomatoes are also added. The tomato paste (concentrated and diluted) is pumped into one of four 200-gal. stainless steel, steam-jacketed kettles equipped with propeller-type agitators.

Possibility of inclusion of bits of metal from cut cans is prevented by a magnetic trap, which is hooked to the pipeline at the discharge end of the sanitary pump.

Meat and vegetable broths, as well as mushrooms, are pre-cooked in smaller kettles and then similarly pumped to the 200-gal. ones. After all ingredients are added, the sauces are slowly concentrated by cooking. They are then pumped to the hopper of the two 8-piston rotary fillers—one for 8-oz. cans and the other for 16-oz.

Empties are fed from a semi-automatic can-and-paper bag unloader that operates about five times the speed formerly accomplished by hand-unloading. This Barker unit removes empties from paper bags and feeds them into the can-conveyor system. A tilt-over aluminum bag holder properly aligns cans for can-fork pickup. From the can elevator, the single row of empties passes through a can washer. Here, about 18 spray nozzles direct water into the cans and a ¼-in. spray manifold with a 3-jet steam extension then blasts remaining water from the cans.

Leaving the fillers, cans are closed by four-spindle seamers. Cans are loaded into retort crates that are raised by electric hoist and rolled over a monorail to a battery of retorts. Heat-processing is safe-guarded by an ATI Cook-Chex retort tag attached to each crate and also by automatic temperature controllers hooked to the timing clock, which flashes a red light at the end of the cook.

After cooling in the retorts, the cans are drained of remaining water, raised by electric hoist and "monorailed" to a Standard-Knapp retort-crate dumper. Here, each crate-load of heat-processed, canned sauce is raised by a hydraulic device and inverted to discharge cans onto an unscrambler that feeds them, single-file, onto a conveyor going to a 500-per-min. wrap-around labeler.

Cans continue past an automatic can ejector. This unit is equipped with a photo-electric eye that scans the passing cans and instantly removes those that are unlabeled or improperly labeled. Cans are automatically packed into cases that are machine-glued and sealed.

End (Resume reading on page 44)

Pacific Coast plant steps up Sardine Processing

● From the time sardines are unloaded at tide level into vats of sea water until they're canned ready for shipment, every step of processing is handled on Cyclone Conveyor Belts. A Wire Mesh Belt transports sardines from vats to weighing machine. From here a Flat Wire belt conveys fish through viscerating and washing operations. An Equalized Spiral Belt carries sardines and tomato sauce through a continuous cooker. And finally, sealing, labelling and packing operations are speeded up by another Cyclone Belt.

Ask our engineers for advice on Cyclone Belts and write Dept. H-14 for free Catalog #4.

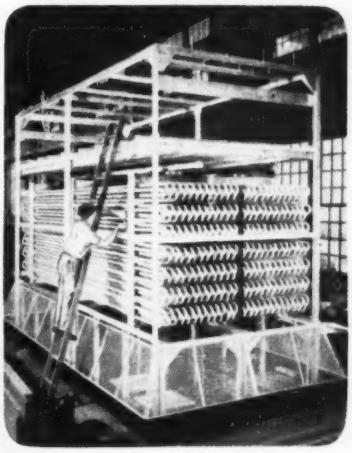
U·S·S CYCLONE METAL CONVEYOR BELTS

CYCLONE FENCE DEPARTMENT
AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION
WAUKEGAN, ILLINOIS

USS

UNITED STATES STEEL

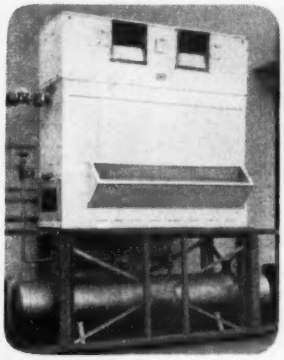
300-ton condenser being assembled.



FRICK

Evaporative Condensers Save Water and Power!

Whether you operate an air conditioning system, a processing plant, or a hotel . . . if you use refrigeration, you can save 95% of the cooling water . . . and lots of money . . . with these efficient condensers. They combine a condenser and a cooling tower . . . evaporate 5% of the water instead of throwing all of it away. Built in 12 sizes, for use with either ammonia or Freon. Ask for Bulletin 234 on these superior condensers: write



Small Condenser in use.

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA. U.S.A.

Also Builders of Power Farming and Sawmill Machinery

For more information, use coupon on page 209.

Recent Inventions

PRODUCTS

Milk Product Made by Pasteurizing Skim Milk, Vacuum Evaporating, Mixing With Water-Fat Emulsion Containing Sodium Caseinate, Then Spray-Dried to Stable Powder—*D. D. Peebles, Hillsborough, and M. D. Girvin, San Antonio, Calif. to Western Condensing Co., San Francisco. No. 2,650,879. Sept. 1, 1953.*

Dried Fruit Product Prepared by Pulping, Sugaring, Cooling and Concentrating, Roll-Cracking to Crystal Fragments, Drying—*J. H. Forkner, Fresno, Calif. No. 2,650,-881. Sept. 1, 1953.*

Plant Product Package Resistant to Product Rot—*J. D. Conti, Philadelphia, to American Viscose Corp., Wilmington, Del. No. 2,652,335. Sept. 15, 1953.*

Peanut Product Made by Soaking Kernel in Boiling Water, Then Cooking in Edible Hot Oil—*J. N. Wergeland, Chevy Chase, Md. No. 2,653,875. Sept. 29, 1953.*

Stabilized Creamed Food Comprising Edible Liquid Thickened With Amylaceous Material, Part of Which is Waxy Rice—*H. L. Hanson, and H. Lineweaver, Berkley, Calif. to U.S.A. No. 2,653,876. Sept. 29, 1953.*

Freeze Preserved Mushrooms Made by Enveloping Each in Adhesive Air and Moisture Impervious Coating—*H. R. Dadly, Toughkenemon, Pa. to (One-Half) J. V. Fidance, Kennett Square, Pa. No. 2,653,930. Sept. 29, 1953.*

Composition for Making Bread Including Defatted Soya Flour, Monocalcium Acid Phosphate, Calcium Carbonate, Potassium Bromate—*R. W. Selman, Jr. and B. G. Carson, to De-Raef Corp., Kansas City, Mo. No. 2,654,672. Oct. 6, 1953.*

Improving Yeast-Raised Bakery Products by Adding Straight Chain Unsubstituted Monohydric Aliphatic Alcohol to Dough—*P. Kass to Atlas Powder Co., Wilmington, Del. No. 2,657,143. Oct. 27, 1953.*

Base Material for Floatable Frozen Confections Consisting of Solid Aerated Slab Containing Bland Tasting Edible Oil, Sugar, Propyl 3,4,5-Trihydroxy Benzoate, and Locust Bean Gum—*J. R. Katz, University City, Mo. No. 2,658,-831. Nov. 10, 1953.*

Infant Food Composed of Lactose, Edible Fats and Proteins, the Fats Containing Palm Oil—*H. W. Howard, Hastings on Hudson, N. Y. and J. F. Muller, Princeton, N. J. to The Borden Co., New York. No. 2,659,676. Nov. 17, 1953.*

PROCESSES

Removing Organic Impurities From Molasses by Contacting With Undried Resin—*H. W. Meijer, Veendam, Netherlands, to N. V. Octrooien Maatschappij "Actvit" Amsterdam, Netherlands. No. 2,650,177. Aug. 25, 1953.*

Washing Side Seams of Cans By Jetting Cleaning Fluid Mixed With Steam, Then Jet Rinsing With Cleaning Fluid—*W. McK. Martin, San Mateo, Calif., W. F. Pillnik, Harvey, and D. E. Wobbe, Maywood, Ill., to American Can Co., New York. No. 2,650,178. Aug. 25, 1953.*

Tenderizing Meat Pieces by Chilling, Then Heating Followed by Re-chilling, With Humidity of Contacting Air Controlled by Product Temperature—*G. S. Sperti, Burlington, Ky. to Institutum Divi Thomae Fdn., Cincinnati. No. 2,650,882. Sept. 1, 1953.*

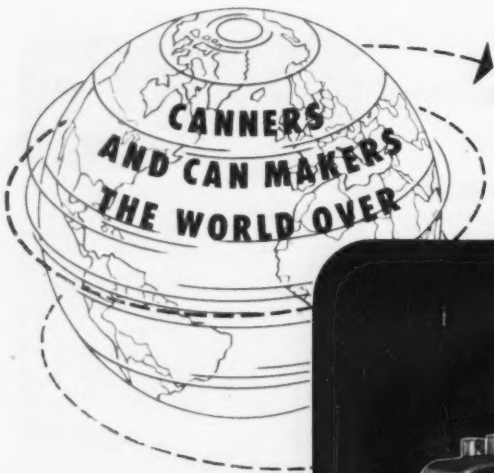
Continuous Ice Cream Freezing by Adding Chilled Gas to Mix, Further Chilling in Expanded Gas Heat-Exchanger and Passing Expanded Gas Into Mix—*W. L. Murphy, to De Raef Corp., Kansas City, Mo. No. 2,651,186. Sept. 8, 1953.*

Method Milling Moisture Conditioned Wheat by Impact on Rotor Disc—*R. B. Dodds, Woodbridge, and A. N. Hibbs, Mount Caramel, Conn. to Safety Car Heating & Lighting Co., Inc., New Haven, Conn. No. 2,651,470. Sept. 8, 1953.*

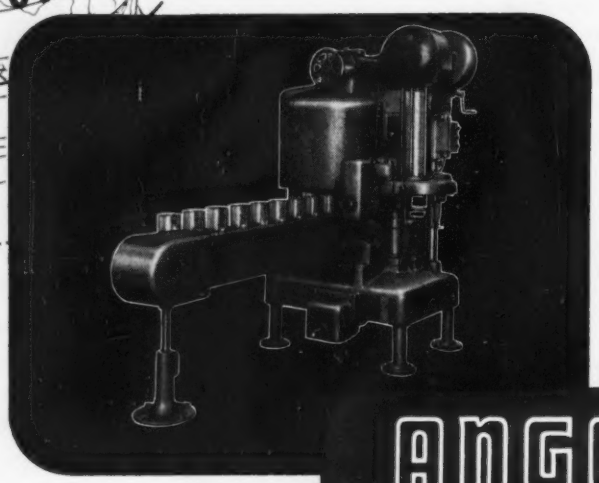
Making Hard Candy by Instantaneously Heating Dispersion of Ingredients, Then Releasing Heat to Avoid Sugar Caramelization—*J. M. Leach, Port Washington, N. Y. No. 2,651,573. Sept. 8, 1953.*

Candies, Confections, and Icings Made Without Heat by Mixing Sugar of Proper Crystal Size With Dried Milk Product Containing Amorphous Lactose, Adding Water and Stirring to Crystallize Lactose—*E. O. Whittier, Washington, D. C. to U.S.A. No. 2,651,574. Sept. 8, 1953.*

Making Available Bitter Substances From Hops by Subjecting Hop Residue to Partial Oxidation to Convert Beta Bitter Acid to Water Soluble Resin—*T. R. Nilsson, Bromma, and K. E. Sandegren, Stockholm, Sweden. No. 2,652,333. Sept. 15, 1953.*



Swing to ANGELUS
CAN CLOSING MACHINES



FOR
Lower Investment
Lower Maintenance
Higher Production

Welcome
to Angelus Booth No. A-15 Annual Canning Machinery and Suppliers Association Convention. Atlantic City, New Jersey – January 23-27.

ANGELUS
Sanitary Can Machine Company

Cereal Puffing Method by Placing in Steam Atmosphere, Cooking, Then Subjecting Product to Subatmospheric Pressure—*J. M. Baer, to Guardite Corp., Chicago. No. 2,653,093. Sept. 22, 1953. Also No.'s 2,653,094; 2,653,095; 2,653,096; 2,653,097. Sept. 22, 1953.*

Heating Dough Pellets to Surface Temperature of 270-280 deg. F., Then Shooting Into Vacuum Zone to Puff and Cold Set—*J. M. Baer, to Coldset Foods Inc., Chicago. No. 2,653,098. Sept. 22, 1953.*

Quick Cooked Cereal Products by Steam Pressure Cooking, Reducing Pressure to Below Atmosphere to Explode and Cold Set—*C. R. Carman, Park Forest, and J. E. Allison, Elmhurst, Ill. to Guardite Corp., Chicago. No.'s. 2,653,099; 2,653,100; 2,653,101; 2,653,102; 2,653,103. Sept. 22, 1953.*

Continuous Extraction of Oil From Vegetable Materials With Hot Alcohol, Cooling, Separating, Purifying Solvent With Alkaline Agent and Separating Insolubles, Reusing Solvent Without Distilling—*R. H. Westergaard, Peoria, Ill. to U.S.A. No. 2,653,957. Sept. 29, 1953.*

EQUIPMENT

Continuous Buttermaking Machine Employing Wormed Press-Off Cylinder With Kneading Means—*W. Wilsmann, to Westfalia Separator, A. G., Oelde, Germany, No. 2,649,377. Aug. 18, 1953.*

Fowl Scalding Tank Employing Side-Wall Water Chambers With Means for Discharging Water Through an Orifice and Down Over the Fowl as it Passes Through a Central Longitudinal Water Channel—*A. W. Sharp, to Barker Poultry Equip. Co., Ottumwa, Ia. No. 2,649,615. Aug. 25, 1953.*

Candy Mold Indenting Device Employing Printer Frame and Impression Panel With Vacuum Hood—*J. Varak, to E. J. Brach & Sons, Chicago. No. 2,649,745. Aug. 25, 1953.*

Tomato Paring and Coring Machine With Rotating Support and Associated Screw—*B. C. Coons, to Food Machinery & Chemical Corp., San Jose, Calif. No. 2,649,878. Aug. 25, 1953.*

Device for Peeling Stem Indents of Fruit—*R. L. Ewald and H. A. Skog, Olympia, Wash. to Special Equipment Co., Portland, Ore. No. 2,649,879. Aug. 25, 1953.*

Mixing Kettle for Cheese Curd Employing Vertical Tube Containing Angular Stirring Blade Driven by Oscillating Shaft—*K. Zeiler, and K. Lenz, to Anton Steinecker Maschinenfabrik A.G. Freising, Germany. No. 2,650,079. Aug. 25, 1953.*

Baking Support for Bagels Mountable in Oven Providing Endless Conveyor—*E. Dornbush, Miami Beach, Fla. No. 2,650,553. Sept. 1, 1953.*

Bake Oven Employing Rotary Support Able to Take Pans of Various Widths—*J. Faulds, Oak Park, Ill. to Faulds Oven & Equipment Co., Chicago. No. 2,650,554. Sept. 1, 1953.*

Paddle for Dry Rendering Cooker With Reversible Drive—*F. J. Bilek, to Globe Equipment Co., Chicago, Ill. No. 2,650,807. Sept. 1, 1953.*

Coating Machine for Edible Products With Means for Rotating Objects While Under Overhead Applicator at Feed End of Inclined Conveyor—*G. G. Oldham, Leesburg, Fla. to American Machinery Corp., Orlando, Fla. No. 2,651,286. Sept. 8, 1953.*

Electrostatic Coating Head for Applying Charged Atomized Material Onto Work on Moving Belt Below—*R. H. Turner, to Electro-Coating Corp., Indianapolis, Ind. No. 2,651,287. Sept. 8, 1953.*

Poultry Scalding Apparatus With Means for Reciprocally Pivoting Supporting Shackle in Vertical Plane Into Scalding Tank—*H. D. Pitts, to Pickwick Co., Cedar Rapids, Ia. No. 2,651,807. Sept. 15, 1953.*

PACKAGING

Box Unit Adapted for Interlocking With Complementary Box—*E. N. Burnett, San Lorenzo, Calif. to Gerber Products Co., Fremont, Mich. No. 2,651,449. Sept. 8, 1953.*

Can Sealing Device Able to Apply Tops of Varying Diameter—*R. T. Zaccard, Chicago. No. 2,654,521. Oct. 6, 1953.*

Vacuum Filler Employing Feed Tube Disposed Concentrically Within Vacuum Passage With Rocking Type Filling Head—*S. J. Busby, London, England. No. 2,654,523. Oct. 6, 1953.*

Screw Capper With Positioning and Tightening Stations, Integrated Cap Feeder, and Rotating Device—*J. Hohl and R. A. Pim to Owens-Illinois Glass Co., Toledo, Ohio. No. 2,655,302. Oct. 13, 1953.*

Filling Machine With Interconnected Container Carrying Devices Fed From Magazines—*J. Riemer, Green Bay, Wis. to Kraft Foods Co., Chicago. No. 2,655,301. Oct. 13, 1953.*

Want more information on any of these recent patents? If so, you may obtain detailed printed copies by writing direct to the U. S. Patent Office, Washington, D. C., giving serial numbers of those you want and enclosing 25¢ for each copy.

These and other food products requiring a thick-boiling starch can now be made better (and often cheaper) with Paygel.

ONE STARCH now replaces blends in all these foods!

PAYGEL

What's your product? If it needs a thick-boiling starch, then chances are Paygel can save you both trouble and money. This unique General Mills wheat starch replaces inconvenient blends of starches in canned soups, salad dressings, pie fillings, confections, dessert mixes, baby puddings, custards and canned specialties.

Paygel is stable. It produces smooth eye-appealing products and has no cereal taste to mask flavors. And it's economical. See for yourself.

Try Paygel free. We'll be happy to send you information sheets, price list, and a sample. Just mail this coupon.

General Mills

Special Commodities Division

MINNEAPOLIS 1, MINN.

Please send me free sample, technical information and price list on General Mills Paygel.

*Name*_____

*Firm*_____

*Firm address*_____

*City*_____ *Zone*___ *State*_____

*Type of product or products*_____

for Money in the Bank

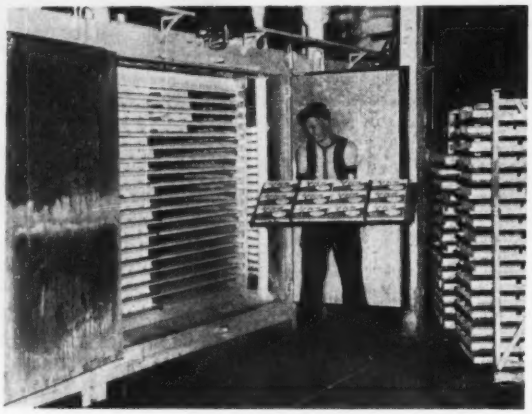
Frozen Food Processors Choose

Amerio DOUBLE CONTACT PRESSURE PLATE FREEZERS

(U. S. Pat. No. 2,608,069)

Economical Operation ***Consistent Quality*** ***Uniform Packages***

Here is an exceptional opportunity to have your frozen food packages, consumer or institutional, register in the minds of customers for repeat sales that put money in the bank.



The consistently good taste of your product in freezing with "Amerios" makes yours the preferred brand. And—you will welcome the speed and simplicity.

See Our Exhibit
Booth A-13
Canning Machinery & Supplies Association.

Amerios Do a Better Job!

Designed For
Ammonia, Brine or Freon
Refrigerant

Amerio
Contact Plate Freezers Inc.
Union City, N.J.
"It's the Contacts that Count"

Send For
Illustrated
Brochure

Ups beef flavor!

• More "beefiness" for "beef" products? Then do as leading makers of bouillon cubes and gravy bases do —add *more* rich braised beef goodness with Huron HVP. This natural product made from wheat gives—and extends—beef flavor to any prepared or processed food product. Comes in a number of forms to meet any manufacturing need. Huron's Technical Service will gladly help you use HVP to your sales advantage. Huron Milling Co., 9 Park Place, New York City 7.

HURON HVP

HYDROLYZED VEGETABLE PROTEINS

The flavor of meat from wheat

just off the press!

new 48 page industrial spray nozzle catalog

Here's the most comprehensive industrial spray nozzle catalog ever printed. Complete data on thousands of standard and special nozzles for every type of spraying.

Write for your free copy of Catalog No. 24.

SPRAYING SYSTEMS CO.
3212 Randolph Street
Bellwood, Illinois

Men & Companies

Donald F. Meisner (left), formerly director of laboratories for American Institute of Baking, has assumed duties with Omar, Inc. **Welker Bechtel** (right), research chemist who has been responsible for extensive studies on staling of bakery foods, will succeed him.

Industry

Antelope Valley Turkey Grower's Assoc. will begin processing 80,000 lb. of poultry a day at its new Los Angeles plant.

A. R. Beane & Son, Inc. has been formed in Lancaster, Va., for processing and canning fruits and vegetables with capitalization of $100,000.

Belmont Packing Co., Detroit, Mich., has been incorporated for $150,000 to process meat products.

Borden Co. has formed a Netherlands subsidiary.

E. J. Brach & Sons is constructing two new buildings at its Chicago plant to add 116,800 sq. ft. production space and cost $1,550,000.

Canada Dry Ltd. will build a new $300,000 bottling plant near Vancouver.

H. P. Cannon & Son Pepper Cannery, Bridgeville, Pa. is establishing a $100,000 factory at Dunn, N. C.

Cantrell & Cochrane Corp., Los Angeles, will open a new soft drinks plant to supply the West Coast and Pacific states.

Carolina Pecan Co., Inc. has opened a large pecan shelling and processing plant in Lumberton, N. C.

Castle Products Co., Irvington, N. J., has opened a new maraschino cherry plant.

Jacob E. Decker & Sons are breaking ground for a million dollar meat processing plant in San Antonio.

Duffy-Mott Co., Inc. has purchased Clapp Baby Foods.

Exchange Lemon Products Co., Corona, Calif., has opened a new 834,000 cu. ft. cold storage facility.

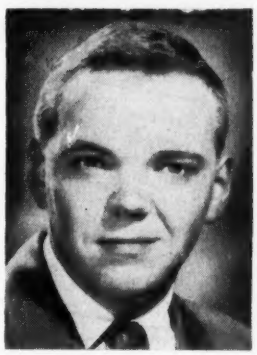
Fairmont Foods Co. has purchased the ice cream and milk business lying in North and South Dakota and northwestern Iowa from North American Creameries, Inc.

Food Packers, Inc.'s Seattle building has suffered fire damage of an estimated $105,000.

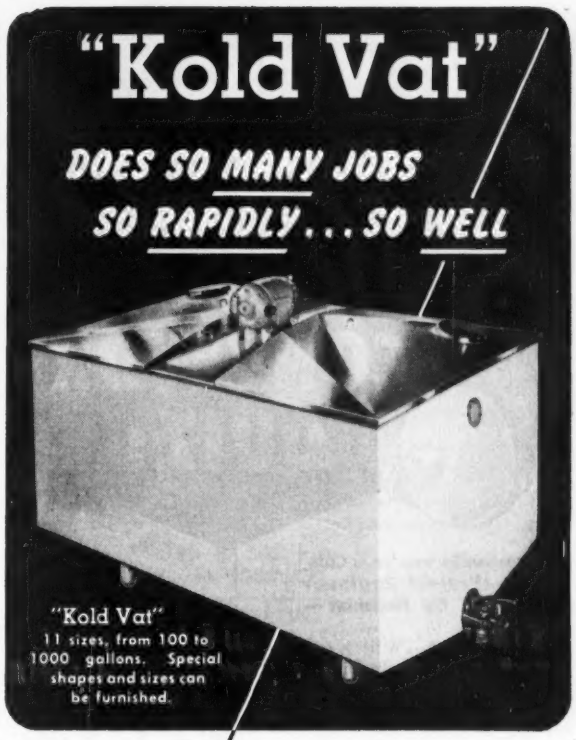
Haines Oyster Co., Seattle, has sold its oyster division to Oystermen's Coop. Assn.

Kirkwood Poultry Co. has opened a large-scale processing plant in Wilmington, Del.

Marine Foods Packing Co., Seattle, has been organized for manufacturing Northwest seafoods products.



John Kemp has been elected president of Kemp Brothers Packing Co., Inc. **Robert L. McClure** is new executive vice-president.


"Kold Vat"
DOES SO MANY JOBS
SO RAPIDLY... SO WELL
"Kold Vat"
11 sizes, from 100 to 1000 gallons. Special shapes and sizes can be furnished.

For example, Cherry-Burrell "Kold Vat" rapidly and thoroughly mixes, blends, cools, and stores an almost endless variety of liquid products. Light syrups and emulsions, extracts, fruit and vegetable juices, flavors, pharmaceutical products and beverages—just to name a few.

And if you need a refrigerated vat, you can have "Kold" surface for freon, ammonia, or refrigerated water. The features below tell why "Kold Vat" saves mixing time, draining time, cleanup time.

Fast Cooling—Mixing: **Shape of vat and agitator produces rapid movement of product over large, refrigerated surface; prevents "patterned" flow; mixes fast without adding air or disturbing product structure.**

Completely Sanitary: **Generously pitched stainless steel lining, large radius corners, cone-type outlet assures fast and complete draining. Outlet and valve meet sanitary codes.**

Easy to Clean: **All stainless product surfaces easy to reach because of low rail and vat dimensions. Hinged, removable covers; removable agitator. No hard-to-clean bottom support agitator bearing.**

For complete information about versatile "Kold Vat," see your Cherry-Burrell Representative. Or Write your Branch or Associate Distributor.

CHERRY-BURRELL CORPORATION

427 W. Randolph Street, Chicago 6, Ill.

Equipment and Supplies for Industrial and Food Processing

FACTORIES, WAREHOUSES, BRANCHES, OFFICES OR DISTRIBUTORS AT YOUR SERVICE IN 56 CITIES

For more information, use coupon on page 209.

TRY THIS Hapman TUBULAR CONVEYOR QUIZ:

Let's assume you're a Conveyor-Project Engineer employed by Hapman —

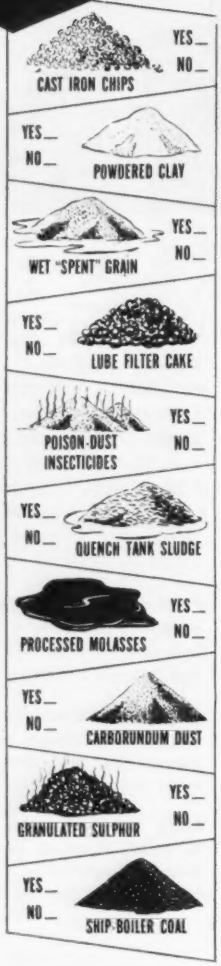
QUESTION 1—Which materials in panel would you advise can be efficiently handled by Hapman Tubular Sealed-pin Chain Conveyors?

QUESTION 2—To elevate a granulated chemical 29 ft. above floor, at 2,000 lbs. per hour, what motor would you specify?

1 H.P.____ 2 H.P.____
3 H.P.____ 5 H.P.____

QUESTION 3—A prospect asks, "What is the *outstanding* advantage of a Hapman Tubular Conveyor?" What's your reply?

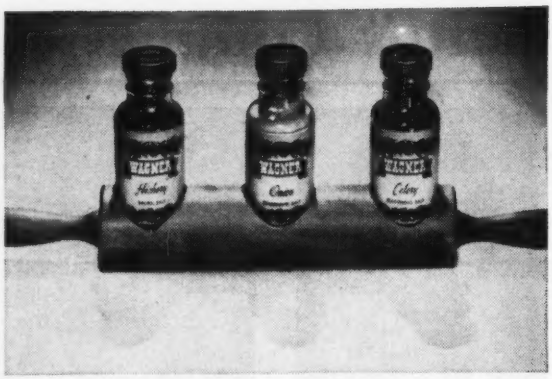
ANSWERS: 1—All now successfully handled except sticky molasses. 2—One horsepower. 3—Hard to answer. In one case, ability to convey *wet* material is vital; in another the Hapman's air-tight seal keeps moisture or dust *out*—or fumes *in*. Ability to curve around obstacles may be essential. Your best answer: "They cut costs!"



NOW SEND YOUR QUESTIONS!

Write for details and Bulletin FE-154

Hapman CONVEYORS, INC.
DIVISION HAPMAN-DUTTON COMPANY
KALAMAZOO MICHIGAN



Star in savory salt mixes

• Savory salt has one job to do: make food taste better. And its star ingredient, MSG, points up flavor like nothing else can! Many famous food manufacturers use Huron MSG in their blends. It's a natural flavor booster. If you sell dry, canned or frozen food, Huron's Technical Service can help you get added sales appeal through added taste appeal. Write Huron Milling Co., 9 Park Place, New York City 7.

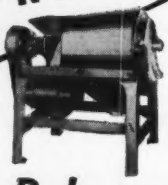
HURON MSG

PURE MONOSODIUM GLUTAMATE 99+%

Made by the pioneers in protein derivatives

TOMATO CANNERS

SOLVE YOUR PULPING PROBLEMS WITH . . .



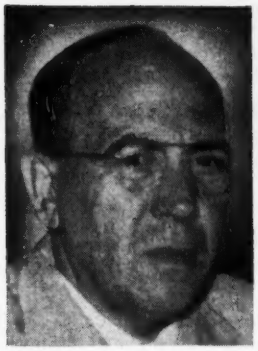
Indiana E-Z Adjust Pulper

Exclusive E-Z ADJUST feature gives you these advantages:

- No shutdowns or delays to make adjustments
- Instant change in "clearance" between paddles and screen
- Effective control over quality of product

Under peak load production you need a pulper you can depend on. The Indiana E-Z Adjust is it . . . a rugged performer that delivers twice the volume of ordinary pulpers of comparable size—25 to 30 tons per hour with only a 10 hp. motor! The instant control feature—a development of Langsenkamp's modern research—eliminates waste due to raw stock . . . assures a product of maximum quality.

F. H. LANGSENKAMP CO.
227 East South Street Indianapolis 25, Indiana



Stefano La Rosa is new chairman of the board of V. La Rosa & Sons, Inc. Also elected were **Peter La Rosa,** president, and **Filippo La Rosa,** executive vice president.

McLarens Ltd. opened a new food manufacturing plant in Vancouver and also announced completion of $250,000 addition to the company's plant at Hamilton, Ont.

National Biscuit Co. will begin construction of $10 million bakery in Philadelphia.

National Sugar Refining Co. has opened a new packaging facility and warehouse in Cleveland.

Orange Crystals, Inc. has been organized in Plant City, Fla. to produce orange juice dehydrated into crystals.

Pabst Brewing Co. has opened its new $15 million brewery in Los Angeles.

Piel Bros. has purchased the Staten Island brewery of Rubsam & Horrmann Brewing Co. which was enjoined only a few hours after purchase.

Quaker Oats Co. and South Puerto Rico Sugar Co. has entered into a contract for the manufacture of furfural from sugar cane waste.

Rockingham Poultry Cooperative is making a $90,000 addition to its plant in Timberville, Va.

Shem-Valley Meat Packers Cooperative is constructing a $100,000 building in Timberville, Va.

Seven Up Bottling Co. of Western Michigan, Inc., Holland, Mich. has been incorporated for $100,000.

Tom Parks' vegetable packing plant in Lompoc, Calif. was destroyed by fire at an estimated loss of $150,000.

Vlasic Foods of Detroit has announced purchase of a pickle processing plant at Lakeville, Mich.

Personnel

W. D. Benson has been named director of Canada Starch Co., Ltd.

Victor L. Bump is new Pittsburgh plant manager of D. L. Clark Co., candy mfr.

Cecil I. Crouse has been elected vice-president of Borden Co.

George W. Dunlap of Canada Dry Beverage Co. was named president of S. Carolina Bottlers of Carbonated Beverages, Inc.

Homer C. Fritsch, erroneously reported here as "former vice-president of Parke, Davis, & Co.", continues in that office in addition to new duties as director of Takamine Lab., Inc.

Edward Guggenheimer is new president of National Pickle Packers' Assn.

E. C. Heddins was elected president of Van Zandt Vegetable Growers Assn.

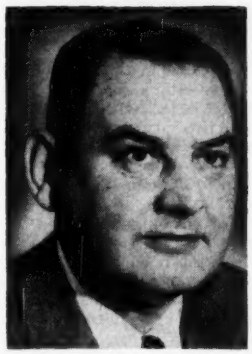
R. R. Hipke was named president of Wisconsin Canners Assn.

Clarence Francis, chairman of board of General Foods Corp., has been appointed member of the advisory board of European Productivity Agency.

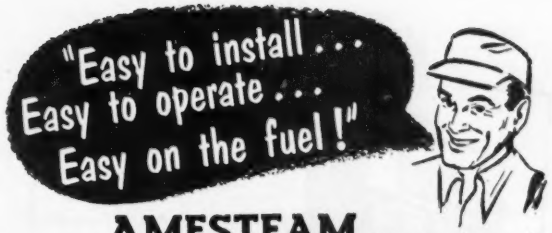
Charles H. Isenman has been chosen president and general manager of Atkins Pickle Co., Atkins, Ark.

Arthur L. Koenig has been named assistant plant manager of Maxwell House Coffee plant in Hoboken, N. J.

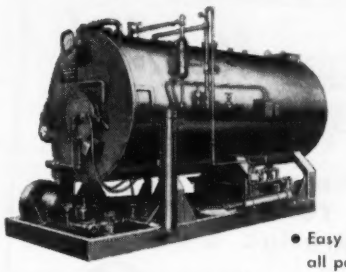
W. W. McCallum, is new president of John Morrell & Co., independent packing firm.



Harvey L. Slaughter, general manager of Durkee Famous Foods Div. of the Glidden Co. has been elected company vice-president.



AMESTEAM GENERATOR



- A complete unit, piped and wired, ready for service connections.
- Needs no special foundation or expensive stack.
- Fully automatic . . . attention-free.
- 80% efficiency means real fuel savings.
- Easy to clean and service . . . all parts accessible.

20 SIZES — 10 to 600 h.p. — 15 to 200# OIL OR GAS

FREE BULLETIN!
WRITE FOR YOUR COPY

Complete engineering facts on the exact AMESTEAM GENERATOR to do your job and save you money. Write today!

AMES IRON WORKS

BOX B-14 OSWEGO, N. Y.

Meat tenderizer plus

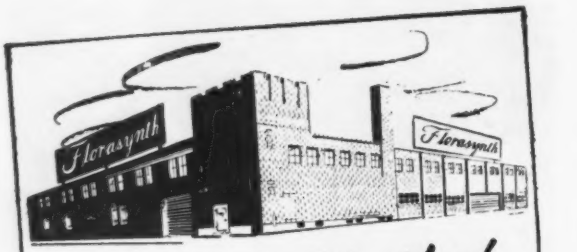
• This famous manufacturer realized that a meat tenderizer could do *two* jobs . . . make meat tender, and bring out the utmost in flavor at the same time. To enhance flavor, he simply added Huron MSG to his formula. This great natural product gives hundreds of grocery store products an added sales boost . . . how about yours? Call on Huron's Technical Service. The Huron Milling Company, 9 Park Place, New York City 7.

HURON · MSG

PURE MONOSODIUM GLUTAMATE 99+%

Made by the pioneers in protein derivatives

For more information, use coupon on page 209.



OUR NEW New York ADDRESS IS NOW . . .

900 Van Nest Ave.
New York 62, N. Y.
TAlmadge 8-6000

Florasynth LABORATORIES, INC.
CHICAGO 6 · NEW YORK 62 · LOS ANGELES 21
CINCINNATI 2 · DETROIT · DALLAS · MEMPHIS · NEW ORLEANS 12
ST. LOUIS 3 · SAN FRANCISCO 7 · SAN BERNARDINO
FLORASYNTH LABS. (Canada Ltd.) · MONTREAL · TORONTO · VANCOUVER · WINNIPEG
PRODUCTOS Y LABORATORIOS FLORASYNTH, S.A. MEXICO 11, D.F.

Strahman AUTOMATIC WATER-SAVER SPRAY NOZZLE

Ideal for Dairy and Food Industries

The Strahman Spray Nozzle does a better job with the least amount of water. This precision made nozzle enables the operator to get any type stream of water to do his job by simply pressing the lever. A soft spray is sent forth with slight pressure on the lever, and a strong straight stream may be had by pushing the lever all the way down. This convenient control of the wash water assures better cleaning with a lot less effort. The nozzle automatically shuts off the momen' the lever is released, thereby eliminating all waste of water.

RENEWABLE RUBBER COVER. The sturdy cover protects the nozzle and your equipment against knocks and dents. When the cover becomes worn, replace it with a new one.

CONSULT YOUR DEALER

STRAHMAN VALVES, INC., 16 HUDSON STREET, NEW YORK 13, U. S. A.

J. Clyde Loftis, executive vice-president of subsidiary Kraft Foods Co., was elected a director of parent company, Natl. Dairy Products Corp.

Frank W. McIntosh has been appointed president and managing director of Pepsi-Cola Co. of Canada Ltd. in Montreal.

Charles H. Nissley, vegetable production specialist, has been named president of N. J. State Horticultural Society.

Dr. Jesse A. Pearce, has been appointed chief chemist for food products by Charles Hansen's of Canada Ltd., Toronto.

Mr. Paul F. Seiger has been named to the position of financial vice-president of Fairmont Foods Co., Omaha.

Howard C. Williams, Cleveland, Miss., has been elected president of Southern Assn. of Ice Cream Mfrs.

Ed White, president of White Packing Co. is new president of Georgia Canners Assn.

Associated Industries

Allied Chemical & Dye Corp's general chemical division has announced that major expansion for making refrigerants is now under way at Baton Rouge, La., works.

American Can Co. has opened a new citrus plant at Plymouth, Fla., with rated annual capacity of 300 million containers.

Aseptic-Thermo Indicator Co., manufacturer of sterilization indicators, has opened a greatly enlarged plant in North Hollywood, Calif.

Atlas Powder Co. has broken ground for $2,700,000 structure in Wilmington, Del. to be completed early in 1955.

Bausch & Lomb Optical Co.'s new superintendent of the Instrument Div. is William H. Webb.

Brea Chemicals, subsidiary of Union Oil Co. of Calif., will add $750,000 dry-ice plant to its present works.

Consumers Glass Co., Ltd., Toronto, will erect a $3 million plant for manufacturing glass containers.

Rolling Oven Co., Inc., Detroit, has been incorporated for $50,000 to manufacture bakers ovens and allied products.

Sutherland Paper Co. has announced plans for the construction of a $2,750,000 converting plant for paper specialties.

Thatcher Glass Mfg. Co., Inc., Elmira, N. Y., has purchased land at Saugus, Calif., to be used as site for new bottle-making factory.

Tywel Manufacturing Corp. has been formed to manufacture air conditioning units for other companies under their brand names.

Westinghouse Electric Corp. began production at its new $45 million appliance division plant in Columbus, Ohio.

Deaths

C. D. Albergotti, 59, owner and operator of Calhoun Pecan Co., St. Matthews, S. C. —Dec. 1.

Dr. Arthur B. Buchholz, 67, former director of bureau of plant industry of N. Y. Dept. of Agriculture and Markets. —Dec. 8.

Virgil Hollingsworth, Sr., 74, founder and retired president of Fine Products Corp., Augusta, Ga.—Dec. 1.

Fred W. Moore, 77, chairman of board of Diamond Crystal Salt Co., St. Clair, Mich.—Dec. 1.

A. J. Bischman has been named president of Consolidated Food Processors. He is succeeded as president of Monarch Finer Foods by **Max. M. Horn.**

Just Off the Press

New Catalogs and Bulletins from manufacturers of equipment and supplies —Free For The Asking—

Food Plant Equipment

Heat Sealers

Rotary heat sealers and belt conveyors in colorful presentation. Illustrated brochure. 8 pages.—*Doughboy Industries, Inc., New Richmond, Wis.*

Circle 239A on Reader Service Card

Steel Boilers

Boilers for high and low pressure steam or hot water heating. Illustrated brochure. 6 pages.—*Kewanee-Ross Corp., Kewanee, Ill.*

Circle 239B on Reader Service Card

Ice Builders

Comprehensive line of ice builders and cabinets with detailed engineering data and directions for installation. 60 pages.—*King Zeero Co., 1447-55 Montrose Ave., Chicago.*

Circle 239C on Reader Service Card

Fire Pumps

Design, construction, and performance of several varieties of fire pumps are contained in Bulletin 7226. 4 pages.—*Ingersoll-Rand, Cameron Pump Div., 11 Broadway, New York 4.*

Circle 239D on Reader Service Card

Drying Equipment

Types of dryers, including single-tube oscillating and multi-louvre models .Book 2413. 8 p. —*Link-Belt Co., 307 N. Mich. Ave., Chicago.*

Circle 239E on Reader Service Card

Glass Insulation

Photos and detailed description of physical properties and uses of cellular glass insulation as reference for engineering and maintenance personnel. Folder. 4 pages. —*Pittsburgh Corning Corp., 1 Gateway Center, Pittsburgh 22.*

Circle 239F on Reader Service Card

Lining Tiles

Design, installation and maintenance of corrosion-resistant linings and tile tanks. Bulletin A-153. 4 pages.—*Stebbins Engineering & Mfg Co., Watertown, N. Y.*

Circle 239G on Reader Service Card

Expansion Bellows

Special type of metal expansion bellows for conveying gas and liquids with welded-diaphragm construction. Bulletin 300. 8 p.—*Titeflex Inc., 500 Frelinghuysen Ave., Newark 5.*

Circle 239H on Reader Service Card

Safety Valves

Descriptions and computing tables of safety and relief valves for steam, air, gas, water, oil and other liquids. Circular 502. 12 pages—*Lunkenheimer Co., Box 360, Cincinnati 14.*

Circle 239J on Reader Service Card

Blow Rings

Self-adjusting blow rings and air ducts of cast aluminum for reverse air jet cleaning. Bulletin 528. —*Day Co., 817-3rd Ave., N.E., Minneapolis 13.*

Circle 239J on Reader Service Card

Clarifying Reactor

Description and illustration of solids contact reactor for clarifying or softening water. Bulletin 5001A. 24 pages.—*Cochrane Corp., 17th St. below Allegheny Ave., Philadelphia 32.*

Circle 239K on Reader Service Card

Bake Ovens

Operating details of oil, gas and electric revolving tray bake ovens with photos and scale drawings. Bulletin 51. 4 pages.—*Washington Industrial Products, Inc., 3429 11th Ave., S.W., Seattle 4.*

Circle 239L on Reader Service Card

Refrigeration Apparatus

Information about control apparatus in refrigeration and air conditioning with applications, specifications and engineering data. Catalog 54-R. 24 pages. —*General Controls Co., 801 Allen Ave., Glendale 1, Calif.*

Circle 239M on Reader Service Card

Air Compressors

Description and photos of several models of two-stage air compressors featuring dual-control operation. Leaflet. 4 pages.—*Kellogg Division, American Brake Shoe Co., Rochester 9, N. Y.*

Circle 239N on Reader Service Card

Electrical Precipitors

Data on latest advancements in electrode design, shell constructions, and rectifier systems of precipitator equipment. Booklet.—*Western Precipitation Corp., 1016 W. Ninth St., Los Angeles, Calif.*

Circle 239O on Reader Service Card

Packaging Machines

Two models of high-speed wrapping and sealing machines. Colored folder. 4 pages.—*Globe Co., 4000 So. Princeton Ave., Chicago 9.*

Circle 239P on Reader Service Card

Industrial Rolls

Wood, metal, rubber nnd plastic rolls for industrial use with description, illustrations, suggestions for greater wear and tear-out dimension sheets. Catalog 48. 48 p.—*Rodney Hunt Machine Co., Dept. RC, Orange, Mass.*

Circle 239Q on Reader Service Card

Air Heater

Description and diagrams of operation and typical applications of pressure-controlled, cylindrical furnace air heater. Bulletin 600A. 6 p.—*Peabody Engineering Corp., 580 Fifth Ave., New York City 36.*

Circle 239R on Reader Service Card

Water Filters

Engineering data and photos of models of filters adapted for water applications. Catalog 300. 10 p. —*Marvel Engineering Co., 625 W. Jackson Blvd., Chicago 6.*

Circle 239S on Reader Service Card

Filling Machines

Line of liquid filling machines, including push-button controlled, vacuum filler, foamless, dripless filler and gravity fillers corresponding to each type of vacuum model. 12 p. catalog.—*Packer Machy. Corp., 30 Irving Pl., New York City 3.*

Circle 239T on Reader Service Card

Force-Balance Positioner

Unit to position equipment requiring high power and long stroke through pneumatic cylinder operating mechanisms. Bulletin 473. —*Foxboro Co., Foxboro, Mass.*

Circle 239U on Reader Service Card

Safety Devices

Information on boiler feeders, low water cut-offs, pump controls and pressure and temperature relief valves with service recommendation chart to guide selection of proper control. Bulletin C-54. 4 p.—*McDonnell & Miller, Inc., 3500 N. Spaulding Ave., Chicago.*

Circle 239V on Reader Service Card

Pressure Vessels

Engineering and manufacturing data on piping and pressure vessels, digest of Boiler and Piping code, stress tables, and reviews of technical literature pertaining to this information. Vol. 1, No. 1. 46 p.—*Taylor Forge & Pipe Works, P. O. Box 485, Chicago 90.*

Circle 239W on Reader Service Card

Steam Traps

Tables, diagrams, typical applications and data covering selection of steam traps. Bulletin 853. 12 p.—*W. H. Nicholson & Co., 12 Oregon St., Wilkes-Barre, Pa.*

Circle 239X on Reader Service Card

Steam Generators

Description of diversified line of steam generators and allied equipment for power, process and space heating, with photos and design drawings. Bulletin G.B.-153. 20 p.—*Union Iron Works, Erie, Pa.*

Circle 239Y on Reader Service Card

Liquid Seals

Operation, selection and installation of cast semi-steel and forged steel liquid seals and expansion valves for refrigeration service. Bulletin 241. 4 p.—*Armstrong Machine Works, Three Rivers, Mich.*

Circle 239Z on Reader Service Card

Volume Pumps

Design and operation of controlled volume chemical feed pumps from basic units to specialized models. Form 57. 6 p.—*Milton Roy Co., 1300 Mermaid Lane, Philadelphia 18.*

Circle 239AA on Reader Service Card

Combination Feeder

Information on combination bin and feeder unit designed to handle difficult-to-feed sticky, mastic material. 4 page folder.—*Pulva Corp., 550 High St., Perth Amboy, N. J.*

Circle 239AB on Reader Service Card

Control Equipment

Recording Potentiometers

Specification sheets offer technical data on recording potentiometers. — *Minneapolis-Honeywell Regulators Co., Brown Instruments Div., Wayne & Windrim Aves., Philadelphia 44.*

Circle 239AC on Reader Service Card

Measuring Equipment

Information on various types of measuring equipment in description of features, photos and charts. 64 pages. Catalog GEC.-1016A.—*General Electric Co., Schenectady, N. Y.*

Circle 239AD on Reader Service Card

Test Instrument

Six different models of portable high current test instruments for safe checking and calibrating current actuated devices with illustrations, specifications and application data. Catalog 653. 4 pages.—*Multi-Amp Corp., Harrison, N. J.*

Circle 239AE on Reader Service Card

Level Indicator

Electronic level indicator. Illustrated bulletin. 8 pages.—*Robertshaw-Fulton Controls Co., 2920 N. Fourth St., Philadelphia 33.*

Circle 239AF on Reader Service Card

Instrument Boards

Information on instrument and control boards for the electrical specifier and plant operating man. Bulletin 700. 8 p.—*Continental Electrical Equipment Co., Box 1055, Cincinnati 1.*

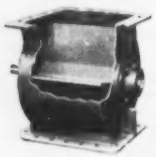
Circle 239AG on Reader Service Card

3 UNITS TO IMPROVE YOUR FOOD HANDLING

Illustrations show only 3 items from Jeffrey's broad line of food handling equipment. Jeffrey makes complete systems or individual units, all designed to give you greater production at less cost.

ROTARY BIN CHECK VALVE for a constant, uninterrupted flow of fine flooding material to Vibrating Feeders or WAYTROLS. Also Bin Level Indicators.

LOW-HEAD BARREL PACKERS for reducing size of containers, increasing capacity and cutting shipping costs. Also supplied with deck to provide conveying action in packing.



Rotary-Type FEEDER for finely pulverized material. Also other types of feeders.

Other Jeffrey Food Handling Equipment includes:

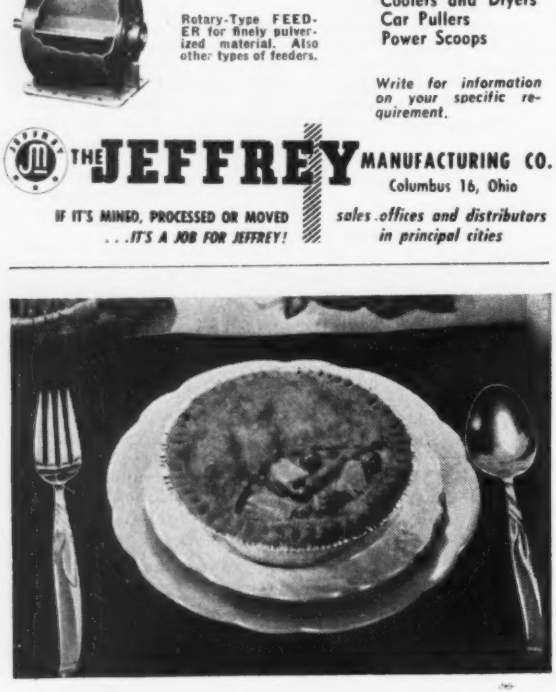
- Constant Weight Feeders
- Batch Weighing Systems
- Batch Proportioning Systems
- Electric Vibrating Feeders
- Vibrating, Mixing Conveyors
- Mechanical Vibrating Conveyors
- Coolers and Dryers
- Car Pullers
- Power Scoops

Write for information on your specific requirement.

THE JEFFREY MANUFACTURING CO.
Columbus 16, Ohio

IF IT'S MINED, PROCESSED OR MOVED . . . IT'S A JOB FOR JEFFREY!

sales offices and distributors in principal cities



RECIPE FOR SALES

• Take a fine quick-frozen product like Swanson's Chicken Pie. Be sure MSG is in the formula . . . then watch sales go up when people taste that "down-home" flavor! Works wonders for prepared canned and frozen foods. Huron's Technical Service will be glad to help you get extra sales through extra flavor. Write Huron Milling Co., 9 Park Place, New York City 7.

HURON MSG

PURE MONOSODIUM GLUTAMATE 99+%

Made by the pioneers in protein derivatives

Flow Transmitter

Design features and uses of combination 1500-psi liquid line-flow measuring element and pneumatic flow-signal transmitter equipped with square root extraction cam. Bulletin 2653. 4 p.—*Hagan Corp., Hagan Bldg., Pittsburgh 30.*

Circle 240A on Reader Service Card

Control Cabinet

Constant temperature and humidity control cabinet for use in laboratories for wide variety of testing operations. Leaflets B8 and B7.—*Food Technology Inc., 5903 Northwest Highway, Chicago 31.*

Circle 240B on Reader Service Card

Platform Scale

Description of pneumatic platform weighing scale adaptable for batch or continuous process control. Catalog 10. 4 p.—*Weighing Components, Inc., 64 Fulmor Road, Hatboro, Pa.*

Circle 240C on Reader Service Card

Testing Instruments

Photos and data on non-destructive and physical testing and measuring instruments for quality control. Bulletin 32. 8 p.—*J. W. Dice Co., Englewood, N. J.*

Circle 240D on Reader Service Card

Low-Temperature Evaporator

Details of indirect thermo-compression or secondary recompression evaporation process with discussion of its application to concentration of various products at low temperatures. Bulletin 300. —*Mojonnier Bros. Co., 4601 W. Ohio St., Chicago 44.*

Circle 240E on Reader Service Card

Research Instrument

Description and photos of unit-type electrophoresis-diffusion instrument featuring double sensitivity, applicable to analysis of electrically active particles in biological and chemical research fields. Form 8H853. 8 p.—*Specialized Instruments Corp., 645 O'Neill Ave., Belmont, Calif.*

Circle 240F on Reader Service Card

Transmitting Equipment

Multiplexing transmitting and receiving system using single circuit. Bulletin 742.—*Bristol Co., Waterbury 20, Conn.*

Circle 240G on Reader Service Card

Horizontal Filter

Model of pressure-leaf filter for applications involving high percents of solids as well as standard liquid clarification. Bulletin H-1051. 4 p.—*Niagara Filter Div., Amer. Machine and Metals Inc., East Moline, Ill.*

Circle 240H on Reader Service Card

Alarm System

Features and advantages of single relay annunciator alarm system in small-size compact model. Leaflet.—*Scam Instrument Corp., 3909 W. Irving Park, Chicago 18.*

Circle 240I on Reader Service Card

Materials Handling

High-Lift Truck

Features of electric truck with telescopic lift and non-tilt platform designed especially for overhead maintenance work. Bulletin. 4 pages.—*Barrett-Cravens Mfg. Co., 4609 S. Western Blvd., Chicago 9.*

Circle 240J on Reader Service Card

Vibrating Conveyors

Conveying units with low horsepower requirements in balanced or unbalanced designs for handling hot castings in foundries to plastic parts in injection molding plants. Bulletin 353. 16 pages.—*Stephens-Adamson Mfg. Co., Aurora, Ill.*

Circle 240K on Reader Service Card

Overhead Handling

System of space-saving, overhead handling through use of monorails. Book 2008.—*Cleveland Tramrail Div., Cleveland Crane and Engineering Co., Wickliffe, Ohio.*

Circle 240L on Reader Service Card

Boom Conveyor

Telescopic boom conveyor for loading and unloading trucks. Bulletin BC.—*Alvey Conveyor Mfg. Co., P. O. Box 3031, St. Louis 24.*

Circle 240M on Reader Service Card

Loading Ramps

Custom engineered all-magnesium loading ramps with safety curbs and hand grips. Bulletin DB-211. 4 p.—*Mag Line Inc., Pinconning, Mich.*

Circle 240N on Reader Service Card

Hydraulic Lifts

Descriptions and photos of standard and de luxe models of hydraulic lifts. Catalog M54. 8 p.—*Big Joe Mfg. Co., 900 W. Jackson Blvd., Chicago 7.*

Circle 240O on Reader Service Card

Dairy Equipment

Variety of materials handling equipment designed especially for the dairy and produce industries, including jacks, semi-live skids, barrell stands, dollies and trucks. Bulletin 54-DJ. 8 p..—*Nutting Truck and Caster Co., 1468 W. Div. St., Faribault, Minn.*

Circle 240P on Reader Service Card

Electric Truck

Features of high lift platform with twin hoist motor and pump for fast lifting speed. Bulletin P1512B. 4 p.—*Yale and Towne Mfg. Co., Materials Handling Div., Roosevelt Blvd. & Haldeman Ave., Philadelphia 15.*

Circle 240Q on Reader Service Card

Milk Tanks

Three types of tank especially designed for milk transport. Bulletins MT-53223 & MT-52253. Each 4 p.—*Heil Co., Hillside, N. J.*

Circle 241A on Reader Service Card

Magnesium Dockboards

Facts about magnesium dockboards designed and fitted to special needs. Separate sheets in colorful file folder.—*Magnesium Co. of America, E. Chicago 19,*

Circle 241B on Reader Service Card

Fork Types

Information on fork truck attachment for crate handling. Leaflet.—*Lewis-Shepard, Dept. R-35, Watertown, Mass.*

Circle 241C on Reader Service Card

Power Conveyor

Pictorial review of applications of power driven conveyors. Catalog 1053. 8 p.—*Sage Equipment Co., 30 Essex St., Buffalo 13.*

Circle 241D on Reader Service Card

Elevator Buckets

Detailed information on line of cast malleable elevator buckets with various chain attachments. Book 2465. 12 p.—*Link-Belt Co., 307 N. Mich. Ave., Chicago 1.*

Circle 241E on Reader Service Card

Gravity Conveyors

Types and uses of roller gravity conveyors with copious illustrations and specification data. Form 642-OPC-1-53-5M. 26 p.—*Lamson Corp., Syracuse 1, N. Y.*

Circle 241F on Reader Service Card

Plant Supplies

Wire Cloth

Various uses of industrial wire cloth in bulk or specially fabricated parts. Bulletin 106. 4 pages.—*Cambridge Wire Cloth Co., Cambridge, Md.*

Circle 241G on Reader Service Card

Bread Enrichment Tablets

Bulletin 42 covers bread enrichment tablets with stabilized vitamin D added.—*Sterwin Chemicals Inc., 1450 Broadway, New York 18.*

Circle 241H on Reader Service Card

Plastic Material

Brochure describes features of new synthetic material for use in plastic pipe, tubing, and fittings.—*Alpha Plastics Inc., 14 Northfield Rd., West Orange, N. J.*

Circle 241I on Reader Service Card

Rodent Repellent

New rodent repellent material is featured in illustrated Bulletin GC-19. 4 pages.—*B. F. Goodrich Chemical Co., 2060 E. 9th St., Cleveland 15.*

Circle 241J on Reader Service Card

Steel Strapping

Advantages of fastening insulation with steel strapping are explained in detail in bulletin.—*Acme Steel Co., 2840 Archer Ave., Chicago 8.*

Circle 241K on Reader Service Card

Masking Tape

Two folders describe and illustrate types and uses of masking tape.—*Mystik Adhesive Products, 26-35 N. Kildare St., Chicago.*

Circle 241L on Reader Service Card

Cleaning Handbook

Data on solution concentrations and methods of application with answers to most common questions on bakery cleaning. Revised Booklet 6-53. 30 pages.—*Oakite Products, Inc., 19 Rector St., New York 6.*

Circle 241M on Reader Service Card

Floor Enamel

Quick drying floor enamel is reported on in folder.—*Wilbur & Williams Co., 130 Lincoln St., Boston 35.*

Circle 241N on Reader Service Card

Industrial Solvents

Cleaning greasy, oily, and dirty machine parts with new solvent is covered in bulletins.—*Marco Chemical Co., 338 North Ave. E, Cranford, N. J.*

Circle 241O on Reader Service Card

Lighting Fixture

Description and photos of lighting fixture employing grating feature. Form 31-F-23. 8 pages.—*Edwin F. Guth Co., 2615 Washington Blvd., St. Louis 3.*

Circle 241P on Reader Service Card

Air Hose

Description of different uses for line of air hoses. Folder. 4 pages.—*Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Tacony & Comly Sts., Philadelphia 24.*

Circle 241Q on Reader Service Card

Mobile Lab

Advantages and details of equipment of mobile laboratory are treated in booklet. 8 pages.—*Fisher Scientific Co., 711-723 Forbes St., Pittsburgh 19.*

Circle 241R on Reader Service Card

Floor Machines

Mechanical and operational features of all purpose floor-maintenance machine. Bulletin 619. 8 pages.—*Brener Electric Mfg. Co., 5100 N. Ravenswood Ave., Chicago 40.*

Circle 241S on Reader Service Card

Tape Dispenser

Electric gummed tape dispenser that moistens, measures, cuts 3 feet per second with special "dial" measurement device. Bulletin DT 5. 4 pages.—*Marsh Stencil Machine Co., Belleville, Ill.*

Circle 241T on Reader Service Card

ORIENTAL WISDOM PAYS OFF

• The Chinese first discovered how MSG enhances food flavor. Today, La Choy uses Huron MSG to bring out the delicate flavor of the choice ingredients in their canned chop suey products. Huron's Technical Service can help you get more flavor and sales by working it into your formulas for prepared or processed food products. Write Huron Milling Co., 9 Park Place, New York City 7.

HURON MSG

PURE MONOSODIUM GLUTAMATE 99+%

Made by the pioneers in protein derivatives

"MEATINESS" FOR DRY SOUP MIXES

• Just add water to the dry soup ingredients you see here, heat, and you've got a delicious bowl of soup! To extend and enhance the beef stock flavor in their soup mixes, many leading makers of these wholesome products use Huron's dry HVP, made from nutritious wheat. If you'd like to add meatiness to your dry or processed foods, get suggestions and samples from Huron's Technical Service. The Huron Milling Company, 9 Park Place, New York City 7.

HURON HVP

HYDROLYZED VEGETABLE PROTEINS

The flavor of meat from wheat

For more information, use coupon on page 209.

materials handling
Professionally
planned for cost reduction

In today's competitive market—cost reduction through planned Materials Handling assumes major significance in profitable operations. Without obligation, our experienced engineers will make a preliminary survey of any plant or problem to determine the potential savings and the cost. *We invite your inquiry*

Gemar *Associates*
CONSULTING **MATERIALS HANDLING** ENGINEERS
GREENWICH, CONNECTICUT
Over 20 Years' Experience

for
FREE READER SERVICE
. . . *use the handy coupon*
on page 209 of the magazine

Get literature, catalogs or detailed information that you need from manufacturers of equipment, materials, supplies, ingredients.

for your convenience
USE READER SERVICE

Industrial Chemicals

Properties and uses of industrial chemicals for industrial uses and market development products. Bulletin 5308 CS-57500. 4 pages.—*Commercial Solvents Corp., 260 Madison Ave., New York 16.*

Circle 242A on Reader Service Card

Plastic Films

Information regarding properties, uses and physical characteristics of polyethylene tubing and sheeting film. Booklet. 16 pages.—*Chester Packaging Products Corp., 284 Nepperhan Ave., Yonkers 2.*

Circle 242B on Reader Service Card

Resistant Paint

Properties and uses of film-forming material resistant to acid, alkalies, salts, moisture and fungus growths. Illustrated brochure 500-197-20M. 20 p.—*Cellulose Products Dept., Hercules Powder Co., Wilmington 99, Del.*

Circle 242C on Reader Service Card

Plastic Pipe

Description of semi-rigid and flexible types of plastic pipe made and various engineering and corrosion data. Booklet 603. 12 p.—*Advtg. Div., Republic Steel Corp., 3100 E. 45th St., Cleveland.*

Circle 242D on Reader Service Card

Low-Temperature Insulations

Description and illustration of design considerations, standards, and application methods of glass-type, low temperature insulation. Bulletin 37-D-1. 20 p.—*Owens Corning Fiberglas Corp., Toledo 1, Ohio.*

Circle 242E on Reader Service Card

Dispensing Equipment

Description and uses of materials dispensing equipment, including power-operated pumps, spray and flow guns, hose and accesories. Catalog 40. 12 p.—*Lincoln Engineering Co., 5701 Natural Bridge Ave., St. Louis 20, Mo.*

Circle 242F on Reader Service Card

Pipe Fittings

Description of comprehensive line of high-pressure tube and pipe fittings with cut-away drawings, photos and engineering tables. Catalog 553. 28 p.—*Flodar Corp., 1366 E. 45th St., Cleveland 3, Ohio.*

Circle 242G on Reader Service Card

Gas Respirator

Features of single chemical cartridge respirator for organic vapors. Bulletin 2309.—*Pulmosan Safety Equipment Corp., 644 Pacific St., Brooklyn 17.*

Circle 242H on Reader Service Card

Miscellaneous

Accident Rates

Data on the 1953 series of accident rates applying to the food and tobacco industries. Booklet 10. 30 pages.—*National Safety Council, 425 N. Michigan Ave., Chicago 11.*

Circle 242I on Reader Service Card

Research Organization

Types of consulting services available for research and testing on various problems. Spiral-bound booklet. 22 pages.—*Foster D. Snell, Inc., 29 W. 15th St., New York 11.*

Circle 242J on Reader Service Card

Heating System

How to produce better heating. Three 4-page bulletins.—*Automatic Devices Co., Inc., Western Springs, Ill.*

Circle 242K on Reader Service Card

Conversion Tables

Frequently-used altitude and refrigeration conversion tables. Plastic pocket-card.—*Tenney Engineering, Inc., Newark, N. J.*

Circle 242L on Reader Service Card

Generating Plants

Review of history of electric plant development, and description of plant operations for alternating current, direct current and battery charging. Booklet. 32 pages.—*D. W. Onan & Sons, Inc., 2600 University Ave., S. E., Minneapolis 14.*

Circle 242M on Reader Service Card

Building Requirements

Summary of recommended building code requirements for vermiculite plastering, acoustical plastic, fireproofing, and concrete. Bulletin. 16 pages.—*Vermiculite Institute, 208 S. La Salle St., Chicago 4.*

Circle 242N on Reader Service Card

Metal Cutting

How to cut metal properly with hand and power hack saws and band saws. Illustrated folder. 28 pages.—*Clemson Bros., Inc., Middleton, N. Y.*

Circle 242O on Reader Service Card

Motion Picture

Motion picture discusses spot welding, seam welding and other types of welding in running time of 22 minutes.—*Free loan from Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22.*

Circle 242P on Reader Service Card

Free Literature—Fast Way

Any of these very-latest catalogs, bulletins, or folders will be sped to you gratis. Just note here the specific literature you want, then circle each key number (theres one given at the bottom of each item) on the handy Reader Service postcard — page 209. Then sign at the bottom and mail.

For your convenience, too, all items in this department are listed and keyed in the Reader Service Section.

PROFESSIONAL SERVICES

PROCESSING PROBLEMS — PRODUCT DEVELOPMENT — MARKET RESEARCH — PLANT LAYOUT and DESIGN — PACKAGE DESIGN and TESTING MANAGEMENT — PUBLIC RELATIONS — GENERAL CONSULTING — PATENTS — CHEMICAL, BACTERIOLOGICAL and NUTRITIONAL ANALYSIS

J. PAUL BISHOP AND ASSOCIATES

Consulting *Food and Chemical* *Engineers*

Specializing in:
Designing, Estimating and Engineering of New and Modernizing of Old Food and Chemical Plants and Processes.

Internationally Known
Write P. O. Box 348

Champaign Illinois

BRADBURY RESEARCH ASSOC., INC.

Food Plant Consultants

PLANT SANITATION—MANDATORY LABELING, LABORATORY SERVICES; Filth in foods, food analysis, bacteriological tests.

817 Moody Street Waltham 54, Mass.

FOOD DEVELOPMENT LABORATORY

Consulting Service

S. W. ARENSON, DIRECTOR
Service to the Baking and Potato Chip Industries
Baking, Frying, Chemical, Physical
Product Development Formulation Quality Control

1403 Eutaw Place 1133 Broadway
Baltimore, Md. New York, N. Y.

GENERAL DRYING CO.

J. I. MURRAY, PhD, Mgr.

Research Spray Drying on Dairy, Food, Chemical and Pharmaceutical Products—New Food Products Development—Milk and Ice Cream Products Development—Consultation on Food Products Advertising—Cooperation with other laboratories.

Hancock, N. Y. Tel-Hancock, N. Y. 187

Now,
more than ever before,

the food industry should take advantage of the opportunity to use the broad experience and knowledge of the consultant and profit by such use.

LEWIN ASSOCIATES

Industrial Consultants

DAVID N. LEWIN, Ph.D., FOOD CONSULTANT
JOSEPH D. LEWIN, CONSULTING ENGINEER
Design — Layouts — Investigations — Consultations — Reports — Market Investigations — Bakeries, Dairy Products—Food Preserving by Heat, Drying, Freezing—Consultation in Managing, Warehousing, Distribution—Formulae, New Products.

8 West 47 St., N. Y. 36, N. Y. JUdson 6-1748

MID-WEST TESTING LABORATORIES

Nutritional and Biochemical Consultation
Testing and Analysis
TOXICOLOGICAL STUDIES

903 Builders Building, Chicago 1, Illinois
CEntral 6-1314

KARL B. NORTON & ASSOCIATES

Successors to
DONALD K. TRESSLER & ASSOC.
Food Technologists and Engineers

Specialists in Food Preparation and Preservation; Equipment Testing and Evaluation; Food Freezing; By-Product Utilization; Manufacture of Pure Fruit Flavors.

North Compo Road Westport, Conn.

SCHWARZ LABORATORIES, Inc.

Consultation on Food Problems
Analyses of Foods and Beverages
Food Plant Design and Process Improvement
Research and Investigations
Legal Testimony

Write for bulletin describing facilities and services
230 Washington St., Mount Vernon, N. Y.

FOSTER D. SNELL, INC.

Research Chemists and Engineers

Organoleptic Panel Testing, Formulation and Stability; Protective Packaging.
Inquiries invited on food research problems.
(Official Laboratory Association of Food Distributors, Inc.)

29 West 15th Street New York 11, N. Y.
WA 4-8800

STRASBURGER & SIEGEL

Chemists - Bacteriologists—Food Technologists
Specialists in Canned and Glassed Foods
Laboratory Services

Testing Tomato Products, Mayonnaise, Pickles, Oils, Fats, Beverages, Sugars, Filth in Foods, Food and Drug Labels, Expert Testimony

1403 Eutaw Place Baltimore 17, Maryland

New Advertisements

received by January 27th will appear in the February issue subject to limitation of space available. Address copy to the

FOOD ENGINEERING

330 W. 42nd St., New York 36, N. Y.

WHERE TO STORE FROZEN FOODS

QUAKER CITY COLD STORAGE CO., INC.

PHILADELPHIA, PA.
3 WAREHOUSE LOCATIONS
Proper Temperature for Frozen Foods

Ingredients

For the Food Processor

CARROT OIL makes foods golden yellow

Carrot oil, like butter, contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A.

Carrot oil is preferred for vitaminising foods because it is a natural vegetable oil and because it contributes vitamin A of high stability and desirable golden yellow color. Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

SEND FOR BOOKLET

New 36-page combined catalog on carrot oil for foods, feeds, and pharmaceuticals. Important reading for most food processors. Write today!

NUTRITIONAL RESEARCH ASSOCIATES
205 Broad St., South Whitley, Ind.

the advertisements in the SEARCHLIGHT SECTION on the following pages are live opportunities in the field of food processing and distribution.

Each announcement represents a current Want or Offering of an organization or individual in the field, with some element of profit in each for whoever can fill the need. Some have money-saving possibilities, others are opportunities for more business; many are employment opportunities; still others offer property, or equipment—used or surplus new equipment.

"Searchlight" advertisements are constantly changing. New opportunities are constantly finding their way into this great Want medium, each issue. Regular reading of the "Searchlight" pages can be as important to you as reading the editorial sections; Editorial matter is NEWS OF OPPORTUNITIES offered in the industry.

for EVERY business WANT "Think SEARCHLIGHT first"

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:

$1.20 a Line—Minimum 3 Lines.

To figure advance payment count 5 average words as a line.

POSITION WANTED undisplayed advertising rate is one-half of above rate, payable in advance.

PROPOSALS, $1.20 a line an insertion.

INFORMATION:

BOX NUMBERS count as one additional line.

DISCOUNT of 10% if full payment is made in advance of four consecutive insertions of undisplayed ads (not including proposals).

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

DISPLAYED RATE:

The advertising rate is $11.50 per inch for all advertising appearing on other than a contract basis. Contract rates on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page.

Send NEW ADVERTISEMENTS to New York City Office, 330 W. 42nd St., New York 36, N. Y., for the February issue closing January 27th

PACKAGING ENGINEER

Leading Mid-Western Food Manufacturer has a permanent opening for a young experienced Packaging Engineer for assignments in:

1. Design and development of improvements to existing packaging machines.
2. Installation engineering for new plants and additions to existing facilities.
3. Extensive application of purchased packaging machinery to increase production and reduce cost.

Natural mechanical aptitude, exceptional interest in Packaging machinery and an engineering degree are helpful qualifications. Unusually good opportunity for right man to assume increasing responsibilities in due time.

Will supplement your previous experience with suitable training in our methods.

Salary depends upon qualifications and experience.

Reply, enclosing full details of background to

P-1170, Food Engineering
520 No. Michigan Ave., Chicago 11, Ill.

ENGINEERS - CHEMISTS

Opportunities in production, research, and pilot plant development. Experience in foods desirable but not essential. Plans include men from current graduates to 6 to 10 years professional experience. Send complete resume of education and experience to:

Personnel Dept.
PILLSBURY MILLS, INC.
Minneapolis 2, Minn.

SALESMEN AND SALES ENGINEERS

For canning machinery sales and customer contact work. Several openings available. Applicants with mechanical or chemical engineering degree and cannery experience preferred. Please send resume of education, experience, references, salary requirement and recent photo, if available, to:

CANNING MACHINERY DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
Hoopeston, Illinois
Attention: Harold L. Link, Sales Manager

WE NEED!

FOOD TECHNOLOGISTS and FOOD CANNING CANDIDATES —junior to top-level.

Call, write or wire:

Gladys Hunting (Consultant)
Employment Counsel, Inc.
7 W. Madison St. Chicago 2, Ill.

OPPORTUNITY FOR CHIEF ENGINEER

Food Processing Equipment

Our client, a progressive manufacturer of diversified processing equipment, is seeking a highly qualified engineer, possessing an excellent background of experience in process and design of food processing or bakery equipment, to fill the position of Chief Engineer of its food equipment division. The man our client is looking for is probably in his forties, or somewhat older, well known in the food processing or baking industries, with the ability and personality to initiate and direct creative and design engineering and to confer with customers. Our client's key personnel know of this ad. Replies confidential. Write:

Stevenson, Jordan & Harrison, Inc.
Dept. SI, 19 West 44th St., New York 36, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITION VACANT

PROCESSOR FOR maraschino and glace cherries. Location metropolitan NY. Established concern. Man must be steady, reliable and know his business. Starting salary $8000. annually. Write complete details, such as age, physical description, background, reason for wanting change, etc. to P-1087, Food Engineering.

SELLING OPPORTUNITY OFFERED

SALES REPRESENTATION—protected desirable territories and substantial earnings offered by one of foremost polyethylene converters. Complete line of drum and carton liners for wide industrial use plus fruit, poultry and produce bags. Large film inventories, expanded plant facilities, production know-how assure "quality, quantity, on-time deliveries." No objection to handling other products. For immediate action send personal resume Box RW-1067, Food Engineering.

EMPLOYMENT SERVICE

SALARIED PERSONNEL, $3,000-$25,000. This confidential service, established 1927, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. F, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

CHEMICAL ENGINEER required, bilingual, experience including canning specially meat. Work will entail management of present manufactured goods and future products. Located in Montreal. Salary will depend on experience, qualifications and so forth. Replies held confidential. PW-9873, Food Engineering.

POSITIONS WANTED

AVAILABLE: DAIRY and Food Technologist, Ph.D. Academic and commercial experience at executive level. Age 35. Desires challenging opportunity and freedom of research expression including application of technology in any phase of the food production, processing and packaging field. PW-9673, Food Engineering.

PRODUCTION MAN, capable technician with diversified experience in processing and packaging line operations of various food manufacturing fields, especially frozen foods, desires responsible position with established packer, where quality and volume are prime factors of productivity. PW-1239, Food Engineering.

FOOD TECHNOLOGIST—Engineering degree and background, experienced in general canning and dairy and cheese, desires change. Also capable of sales, personnel work, or cost analysis. Knowledge of statistical quality control. Managerial ability. Salary secondary. Family man. Box PW-1165, Food Engineering.

DAIRY AND Food Chemist, Ph.D. (short hair) from the second best school in the country. Broad background (not physical) in business, bacteriology, quality, control, and statistics. Academic experience in teaching and research; commercial experience with top management and technical service. Top rating on industrial psychology tests. Plenty of propulsion and perseverance. Excellent references from peasants, pedants, preachers, and present proprietors. Are your processes perfect? Please write PW-1169, Food Engineering.

AVAILABLE FEBRUARY 1st Experienced production manager in Bakers Specialties, jams, jellies, flavors et cetera. Supervision, formulation, sales. PW-1025, Food Engineering.

SELLING OPPORTUNITY WANTED

BROKER SEEKS contact with suppliers, Importers for Delicatessen trade in California. RA-1121, Food Engineering.

WANTED

ANYTHING within reason that is wanted in the field of Food Engineering can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

WANTED

TO EXPEDITE PRODUCTION

Food Processing Equipment including Aluminum and S/S Kettles, Mixers, Vacuum Pans, Dehydration equipment, Grinders, Elevators, Stills, Colloid Mills, Conveyors, Filters, Packaging Units, Wrapping Machines. Will consider a set up plant now operating or shut down. When offering give full particulars.

P. O. Box 1351
Church Street Sta., New York 8, N. Y.

FOOD PLANT WANTED

We are now manufacturing over $20,000,000 in various lines and wish to expand by acquisition of assets of stock of one or more industrial companies. In our negotiations the sellers' problems and wishes will receive full consideration. Present personnel will normally be retained.

Address all replies
"Confidential" C. J. GALE, Sec.
233 Broadway, N. Y. 7, N. Y. BA 7-1810

MODERN REBUILT EQUIPMENT
At Tremendous Savings

UNION Rebuilt Machinery — Established 1912

Elgin 24-Head Rotary Vacuum Filler.

Resina Model LC automatic Capper.

Capem 1SF automatic Capper.

Kyler A, Burt adj. Wraparound Labelers.

Baker Perkins BB, Unidor (Vacuum) 4 to 150 gal. Double Arm Jacketed Mixers, Sigma or Fish Tail Blades.

Koven 2500 gal. Steam Jacketed Spiral Paste Mixer.

Day, Robinson Dry Powder Mixers and Sifters, 200, 600, 1300, 10,000 lbs.

850 gal. Steel Vertical S. J. Mixer.

B. P. type 3500 gal. Steam Jacketed Double Arm Mixer.

Day 650 gal. Jacketed Jumbo Mixer.

Stokes, Day, New Era, Hottman Mixers, 2 to 3500 gals. with/without Jackets, Single and Double Arm Agitators.

Fitzpatrick "D" Comminuter.

Mikro 4TH, 3TH, 3W, 1SH, Bantam Pulverizers; Schutz O'Neill Mills.

Tyler Hum-mer #27 2-Deck Electric Sifter.

F. J. Stokes RD3 and RBB (1200 plus per min.) Rotary Tablet Machines.

Colton 2, 3 Rotary & 4 Tablet Machines.

Stokes & Smith A and B Transwrap.

Stokes & Smith HG88 and G1, Duplex Auger Fillers.

Whiz Packer and Triangle Vol. Fillers.

Triangle Package Models G1, G2C, G2S, N2CA, Elec-Tri-Pak Fillers.

Horix 14-Head Rotary Vacuum Filler.

Filler 4, Hope 6 S.S. Piston Fillers.

Doughboy, Amsco Rotary Bag Sealers.

Standard-Knapp No. 429 Carton Sealer.

Hudson Sharp Campbell Cello. Wrapper.

Hayssen; Package Machy. Co. FA, FA4, DF, CA2; Miller and Scandia automatic cellophane Wrappers.

Oliver 799E auto. cellophane Wrapper.

Shriver, Sweetland, Alsop Filter Presses.

Pneumatic automatic Cartoning Unit, 60 and 30 per min.

Additional Information and Quotations Available on Request
Write Today or Wire Collect

UNION STANDARD EQUIPMENT CO.
318-322 Lafayette Street New York 12, N. Y.

TOP PRICES PAID FOR YOUR SURPLUS EQUIPMENT

FOR SALE

40 gal. S. S. Clad Kettle, Jkt.
75 gal. Monel Jktd. Kettle, 33" x 27".
100 to 200 gal. S. S. Mix Tanks, water jkt.
200 gal. Pfaudler Glass Lined Tanks, water jkt.
1000 and 3000 gal. Glass Lined Tanks
26" Centrifugal Extractors, 3 H.P.
75 to 1500 gal. Homogenizers or Viscolizers
Model 148C Stokes Vacuum Pump, 1½ H.P.
Hobart Grinder, 1½ H.P.
3000 gal. S. S. Truck Tanks, Trailerized
34" x 84" Overton Double Drum Dryer
5-Unit Room Coolers, Freon or Ammonia
3 Ton Clark Fork Lift Truck, solid tires
Milk Pasteurizers, Coolers, Fillers, Washers

Send us your inquiries

LESTER KEHOE MACHINERY CORP.
1 East 42nd Street New York 17, N. Y.
Murray Hill 2-4616

– FOR SALE –

8—Groen Stainless Steel Jacketed Kettles, 80 gallons each.

2—Stainless Steel Jacketed Vacuum Kettles, 500 gallons each.

2—Stainless Steel Jacketed Vacuum Kettles, 200 gallons each.

1—Pfaudler glass lined Jacketed Reactor, 30 gallons.

1—Pfaudler glass lined Jacketed Reactor, 100 gallons.

1—Link Belt Steel Roto Louvre Dryer 7½' x 20'

1—Sharples Type 316 Stainless Steel Super D Hydrator Model C-20.

R. GELB & SONS, INC.
Est. 1886 UNION, N. J. UNionville 2-4900

RELIABLE PROCESSING EQUIPMENT from LOEB

VACUUM PAN: Henssey 36" stainless steel.
VACUUM PAN: Stokes 25 gal. stainless steel.
MIXER: Read 380 gal. stain. steel, 50 hp.
MIXER: Day 1 bbl. st. steel, jacketed.
MIXER: Abbe Lenart, st. steel, 100 gal.
POWDER MIXERS: 100 to 2000 lb. capacities.
KETTLES: Savage 50 gal. st. steel, tilt back, dbl. act. agitators, 125 psi.
KETTLES: Stainless steel, 20 to 100 gallons.
STARCH COOLER: 100 gal. st. steel, agitated.
DRYER: Nordyke-Marmon 80 bu., st. steel.
DRYER: Devine Vacuum Drum 2' x 4', st. steel.
CARTON SEALERS: Ceco model 3901.
LABELERS: New Jersey, Burt, Knapp, World.
FILTER PRESSES: 7" to 24" sizes.
PISTON FILLERS: Geyer, Elgin, Kiefer, M&S.
LIQUID FILLERS: Vacuum and Siphon types.
PREHEATER: CP double row 14 s.s. tubes 10' lg.
POWDER FILLERS: Triangle, Stokes & Smith, Edtbauer, Speedee.
SCREENS: Rotex and Roball 20 x 48".

"REBUILDERS FOR 29 YEARS"

LOEB EQUIPMENT SUPPLY CO.
1931 W. NORTH AVE. • CHICAGO 22, ILL.
Brunswick 8-5326

MODERN PACKAGING EQUIPMENT
FOR IMMEDIATE DELIVERY

PNEUMATIC SCALE CO. Automatic Cartoning Line, consisting of: Automatic Feeder, Bottom Sealer, Liner, Filler, Top Sealer & Compression Unit.

PNEUMATIC SCALE CO. Large and Small Liners.

PNEUMATIC SCALE CO. Tightwrap, High Speed.

PNEUMATIC SCALE CO.—WORLD and PONY fully automatic and semi-automatic labelers, 60-120 per minute.

PNEUMATIC SCALE CO., CONSOLIDATED AND RESINA fully automatic Cappers, 1, 3 and 4 Head.

STANDARD-KNAPP Model 429 Case Sealer and Compression Unit.

STANDARD-KNAPP Case Loader and Unloader.

STOKES & SMITH model HG84, Twin Auger Filler with Vacuum Attachment, Also Models G and GD.

Partial List—send for complete list of equipment in stock.

WANTED

PNEUMATIC SCALE CO. automatic feeders and bottom sealers. Medium or high speed. Will also purchase complete lines.
PACKAGE MACHINERY CO. Model FA or FAQ cellophane wrappers.

ALLIED EQUIPMENT CO.
940-946 Nepperhan Ave., Yonkers 3, N. Y.
Phone: Yonkers 5-0442

FMC

Are You Set for 1954? STREAMLINE PRODUCTION, Check Your Equipment!

FMC will trade for your idle machines, buy your surplus units; sell or rent you pilot plant or large production equipment. Get set for a productive 1954.

General American Twin Drum Dryer 42" x 120" complete
Cincinnati Meat Grinder 10 HP
FMC Retorts 42" x 72"; others
CRCO Juice Extractors
Langsenkamp S.S. Pulpers
A. K. Robbins, Tomato Washer
Biro Stainless Meat Saw
Sterling Peelers; Dicers
Max Ams Can Seamers
Boilers 5 HP to 317 HP
Brierly Citrus Chippers
Buffalo Kraut Cutters
Island Equip. Unscrambler
KETTLES and TANKS in S.S., Nickel, Aluminum, Copper, Iron

Stainless Steel Tanks - Never Used
At Way Below List Price
Complete with Agitators
5 Vertical 450 Gal. 56" x 44"
6 Horizontal 1160 Gal. 66" x 72"
11 Horizontal 2120 Gal. 76" x 100"

MIXERS

New and rebuilt ribbon type Mixers in steel and Stainless in all sizes
Heavy Duty Double Arm Mass and Do Mixers
3 American Sterilizers 32"x48" and 42"x 60" Heavy Duty Horizontal Retorts; 6'x14' Heavy Duty Jacketed Agit. Vac. Cookers 4'x7'7"
Horix SS 14 stem Automatic Grav-Vac. Fillers.
Kiefer Rotary Vac. Fillers up to 24 stations Ayers and Berlin Chapman S.S. Juice Fillers
M. & S. 10 Piston Stainless Steel Aut. Fillers M. & S. 6 Piston Bronze Automatic Fillers Filler Machine Co. Piston Fillers up to 11 stations
Food Machinery S.S. Hand Pack Filler
Triangle Electripak 4 Station Automatic Filler with conveyor
Stokes & Smith Model GI Auger Type Filler
Automatic Cappers by Capem, Resina, Seamers and Sealers by Max Ams
Meat Grinders, Peelers, Kraut Cutters, Dicers, Slicers, Washers.
Pulpers, Juice Extractors, Colloid Mills, and Centrifugals.
Labelers, both semi-automatic and automatic.
Can Casers, Gluers and Sealers and general packaging equipment.

FRED R. FIRSTENBERG, Pres.

Phone WOrth 6-3456

FIRST MACHINERY CORP.
157 Hudson Street,
New York 13, N. Y.

YOUR SATISFACTION IS OUR BUSINESS

1—Bird S.S. 48" Sus. Style Cent.
2—Blaw-Knox Jack. Autoclaves 110 Gal. 2000 psi.
4—Vac. Shelf Dryers 6 to 17 Shelves.
5—Tray Dryers 16 to 250 Sq. Ft.
1—Buflovak 6' Vac. Crystallizer.
2—Sperry 18" C.I. Jack. Filter Presses.
10—Shriver 12" to 30" Filter Presses.
1—Sweetland #12 Filter 72 Brze. Leaves.
1—S.S. Condenser 368 Sq. Ft.
2—Vert. Closed 6000 Gal. Stainless Tanks.
8—S.S. Jack. Kettles 125 to 300 Gals. Ag.
2—Mixers 20 Gal. Jack. D.A.—15 H.P.
1—Read 100 Gal. Jack. D.A. Mixer 40 H.P.
8—Horiz. Spiral Mixers 100 to 2000#.
2—St. Regis Bag Fillers Type 100 L-S.
1—Keeler C.P. 350 H.P. Boiler.
4—Rubber Lined Steel Tanks, 42,000 Gals. Each.
2—Vert. 3500 Gal. Rubber Lined Tanks.
5—Vertical Retorts 40"x72".
1—Horiz. Stainless Spiral Mixer 40 Cu. Ft.

We buy complete plants or individual items. Send us your lists and inquiries.

THE MACHINERY & EQUIPMENT CORP.
533 West Broadway, New York 12, N. Y.
GRamercy 5-6680

ECH ALWAYS OFFERS UNUSUAL BUYS

FMC Potato Steam Peeler, Cap. Ton per day
50 gal. SS Jktd. Kettle, Dbl. mot. Agtd. 2 HP
Day 15 gal. SS Pony Mixer, 2 HP Exp. Pf. Mtr.
Schutz O'Neil #3 Dustless Sugar Mill
Standard Knapp Can Labeler, Adj. to gallons
Manton Gaulin SS Colloid Mill, Type LP, 1½ HP
Niagara Whip Gyro #10D Sifter, 3 Separations
2200 gal. S/S Horizontal Tanks, Insulated
Charlotte S/S Colloid Mill, Model A15, 15 HP

NEW MACHINERY DIVISION
New Steel & S/S Tanks & Jktd. Kettles, All Sizes
New Steel & S/S Ribbon Mixers, All Sizes

WHAT HAVE YOU FOR SALE?
For Better Buys & Service
Phone SOuth 8-4451—9264—6782
YOU CAN BANK ON

EQUIPMENT CLEARING HOUSE, INC.
289-10th ST., BKLYN 15, N. Y.

WIDE CONVEYOR BELTING

42"—2 ply Balata—Used, Good ft. $1.50
42"—Rollers—B.B.—with Shafts ea. $4.00
Speed Reducers for Conveyor Drives
Reeves and Lewellan Variable Speed Units

HARRIS MACHINERY CO.
501 30th Ave. S.E. Minneapolis 14, Minn.

DOUGHNUT MACHINE

Automatic, 80 doz. hour. Doughnut Corp. of America Model A, Excellent condition, very clean. 3/60/220 volt. New price $2295.00. Our price this machine ONLY $850.00 FOB Louisville. Guaranteed fully satisfactory.

J. J. STONE SUPPLY COMPANY
700 E. Madison St. Louisville 2, Ky.
Wabash 3700

FOR SALE
DRUM DRYERS

(TWO) Atmospheric double drum dryers, 32" x72" and 32" x 100". Complete with conveyors, elevators, hoods, and motors. Excellent condition, available for personal inspection. Write

FS-1122, Food Engineering
520 No. Michigan Ave., Chicago 11, Ill.

BAG PACKAGING MACHINE

4 Brown Bag Filling Machines—Model PFM—complete with hoppers, bag boxes, grippers, discharge racks, motors, air-regulators, air hose, etc.—ready to operate at 50 bags per minute—mounted on casters for easy moving—only 3 years old and attractively priced.

WYLER & COMPANY
1050 Fullerton Ave., Chicago, Illinois

NEW STEEL TANKS For Sale — SACRIFICE PRICES —

(Located Chicago Area)

These are brand new tanks, never used, located in yard next to railroad siding, constructed ⅜" steel throughout; can be used for pressure, unlined, with stands, manhole in head, etc. Inspection invited. Offer subject to prior sale:

13—7800-gal. approx., 9'6" dia. x 17' high
8—8700-gal. approx., 10' dia. x 17' high
12—9300-gal. approx., 10' dia. x 18' long
1—9800-gal. approx., 12' dia. x 19' long

Tanks can be purchased individually or in lots; dealers invited; subject to prior sale.

FS-1072, Food Engineering
330 W. 42 St., New York 36, N. Y.

FOR SALE
C. E. BOILER

Water tube, 357 H.P., Hagen controls, Peabody combination oil or gas burner, fully automatic, used only 3 years.
Will sell cheap or exchange for 75 H.P.

MERCHANT'S COLD STORAGE & WAREHOUSE CO.
2529 Orleans St. Detroit 7, Mich.

WANTED

FILLER
WANTED

LATE MODEL SLIGHTLY USED 4 or 6 spout filler for jelly and semi-fluid products. Also jelly cooler or retort to cool 110 dozen in hour or less. Describe both fully.

Address: EQUIPT. DEPT.
P. O. Box 3498 Phila. 22, Pa.

Wanted DEODORIZER

In good condition, large size capacity for vegetable and animal oils.

W-1086, Food Engineering
330 W. 42 St., New York 36, N. Y.

Your inquiry will have Special value . . .

If you mention this magazine, when writing advertisers. Naturally, the publisher will appreciate it . . . but, more important, it will identify you as one of the men the advertiser wants to reach with this message . . . and help to make possible enlarged future service to you as a reader.

A BRILL BUY
. . . IS THE BEST BUY

SEE THESE VALUES!

3—Bird 40" stainless steel Suspended Centrifugals.
1—AT&M 18" stainless steel Suspended Centrifugal.
1—2800 gallon 316 stainless steel Tank
3—Aluminum Vertical Tanks 2300 and 1400 gallon.
1—Hersey 4' x 26' Monel Rotary Dryer.
1—Hersey 3' x 26' stainless steel Rotary Dryer.
2—Link Belt 2'7" x 8', 3'10" x 16' Roto-Louvre Dryers.
4—Devine Vacuum Dryers 4, 6 and 10—40" x 43" shelves.
3—Stokes 18" x 42", 30" x 8', 3' x 15' Rotary Vacuum Dryers.
2—Pfaudler 1000 & 500 Gallon, glass-lined, jacketed, agitated Kettles.
2—Pfaudler 100 gallon, glass-lined, jacketed Stills.
1—Pfaudler 5 gallon, glass-lined jacketed agitated Kettle.
3—Buflovak 5' x 12' 48" x 108" 42" x 90" double drum Dryers.
3—Groen 150, 125 gallon, stainless steel, agitated, jacketed Kettles.
3—Mikro Pulverizers #2TH stainless steel, #1SI, #1SH.
1—Robinson 4000# Heavy Duty Mixer.
6—Rotex 40" x 120", 40" x 84", 20" x 48' single and double deck Sifters.
3—Sprout Waldron 40' x 84" single deck, stainless steel Sifters.
1—Sperry 24 Aluminum P & F Filter Press.
3—Sweetland Filters #7, #10, #12.
6—Oliver Rotary Filters 4'x5', 5'x5', 8'x8', 8'x10', 8'x12'.

Send for complete stock list

BRILL
EQUIPMENT COMPANY
2401 Third Ave., N. Y. 51, N. Y.
Tel: CYpress 2-5703 - Cable: Briston, N. Y.

Equipment Bargains - Used & New

WORKING CONDITION

Four used General American Transportation Co. feed presses complete with drive units and motors, $1750 each.

One 1937 Gen. Amer. Trans. Co. 50-ft. steam tube dryer complete with dust dome, stack, drive units, $3000.

One 1939 Gen. Amer. Trans. Co. 50-ft. steam tube dryer complete with dust dome, stack, drive units, $5000.

Subject to prior sale, loaded F.O.B. Orlando.

DR. P. PHILLIPS CANNING CO.
P. O. Box 3753, or phone 6106
Orlando, Florida

FOR SALE
40 gallon stainless steel steam jacketed tilting kettle for 100 lbs. working steam pressure.
38" Copper Revolving Pans with steam coils.
300 gallon Copper Still with condenser and tank.
80 quart 3 speed Read Vertical Mixer.
#76 Enterprise Food Grinder, belt drive.
Burns Split Nut Peanut Blancher, motor drive.

SAVAGE BROS. CO.
2636 Gladys Ave. Chicago 12, Ill.

FOR SALE

2—Cherry-Burrell Sanitary pumps complete with motors, 125 G.P.H. and 400 G.P.H.

FS-9735, Food Engineering
330 W. 42 St., New York 36, N. Y.

IN STOCK

1—Resina Screw Capper for pt., qt. & gal. cans.
1—Fitzpatrick model D6 Comminutor.
1—Monel Tank, 3500 gal., 6' D x 16' H.
3—Horiz. Ribbon Mixers, 40 cu. ft.
2—St. St. Jacketed Kettles with double motion agitators—100 gal. & 150 gal.
6—Pfaudler unused St. St. Jacketed Kettles—36 & 65 gal.
6—50 gal. Lee Tilt Kettles, St. St., 125# jkt. pr.
1—Sharples Centrifuge, St. St.
2—Lee 300 gal. T316 stainless steel salad dressing starch base cookers, water jacketed, double motion agitators.
1—3000 gal. Horiz. Stainless Steel tank, insulated & agitated, sanitary fittings, excellent for transporting, storing or holding milk, food products, wines, etc.
35—Stainless Steel Tanks, 30, 60, 100, 150, 200, 300, 400, 500, 1000, 3000, 5700 gal.
8—Stainless Steel shell and tube heat exchangers from 14 to 400 sq. ft.
3—Stainless Steel Baffle Plate, Columns or Extraction Towers, 5' dia. x 50' high.
3—13 gal. Stainless Steel Jacketed Autoclaves.
35—Aluminum Tanks, closed, 275, 480, 1350, 1450, 2300, 3000, 4100 gal.
8—15,000 gal. Vertical Steel closed Processing Tanks, 80# int. W.P., with 970' 3" pipe coil and turbine agitator with 40 HP drive.
2—Triangle G-2-C Elec-Tri-Pak Weighers & Fillers.
1—Elgin Twin Piston Filler.
2—Mojonnier #90 Rotary Vacuum Fillers, 14-spout; stainless.
1—Pneumatic Scale Auto. Duplex Labeler, Front & Back.
1—Kyler model "H" Wrap Around Labeling Machine, to #10 cans.
1—Stainless Steel T316 Bin, 275 cu. ft.
2—Sweetland Filters #10 and #12.
40—Welded Steel Tanks with Brewery type lining from 3800 gal. to 13,700 gal. sizes, dished heads.

PERRY
EQUIPMENT CORP.
1411 N. 6th St. PHILA. 22, PA.

WE HAVE IN STOCK
FOR IMMEDIATE DELIVERY
THE FOLLOWING TYPES OF EQUIPMENT

BOILERS
CANNING
CONFECTIONERY
DAIRY
FILLERS
MATERIAL HANDLING
STAINLESS STEEL JACKETED KETTLES
MEAT PACKING
MIXERS
MOTORS
PULVERIZERS
PUMPS
REFRIGERATION
SCALES
STAINLESS-STEEL TANKS
LARGE & SMALL STEEL TANKS

Consult Us for Your Food Processing Equipment
Send Us Your Inquiries
We Buy One Item or Entire Plants

AARON Equipment Company
1347 So. Ashland Ave., Chicago 8, Illinois
PHONE: CHesapeake 3-5300

GAIN MORE IN '54

"CONSOLIDATED"

expands quarters and increases facilities to serve you better at new location in

HOBOKEN, N. J.

3—Devine # 28 Vacuum Shelf Dryers, ea. 20 shelves 59' x 78" Complete.
1—300 gal. Stainless jacketed, agitated Reaction Kettle.
2—S.S. Fitzpatrick Comminutors, 1 jack., 7½ HP; 1—Model M.
1—Shriver 42" x 42" cast iron Pl. & Frame Filter Presses, 18 chambers.
1—Oliver Rotary Filter, 6' x 6', Acid Construction.
4—Mojonnier S.S. Vac. Pans, 3', 5', 6'.
1—Sperry 24" x 24" C.I. Pl. & Frame, 25 chambers, 2" cake.
12—Sperry 18" x 18" cast iron Filter Presses, P. & F., 11 chambers.
3—6' x 50' Louisville Rot. Tube Dryers.
6—Horiz. Dry Mixers, 12,000#, 2,000#, 1,000#, 600#, 400#, 200#.
1—Day size 30 Imperial jacketed 75 gal.
3—Mikro Pulverizers, 4TH, 2TH, 5H.
1—#12 Sweetland Filter, 1—#2, 23 CU lvs., 1⅛"c.c.
1—Std. Knapp #429 Self-adjusting Gluer-Sealer & Compression Unit.
4—Buflovac Atmo. Dbl. Drum Dryers, 32" x 72", 32" x 90", 42" x 120".
3—Anco 4' x 9' Chilling Rolls.

Only a Partial Listing

• WANTED •

SEND US A LIST OF YOUR IDLE EQUIPMENT
SINGLE ITEMS TO COMPLETE PLANTS

Our 37th Year

CONSOLIDATED PRODUCTS COMPANY, INC.
* OBSERVER HIGHWAY AND BLOOMFIELD STREET
HOBOKEN, N. J.
N. Y. Tel: BArclay 7-0600
N. J. Tel: HOboken 3-4425

ADVERTISERS IN THIS ISSUE

Advance Oven Co. 196
Allied Chemical & Dye Corp., Nitrogen Div. L154
Allis-Chalmers Mfg. Co. 4
American Norit Co., Inc. BR229
American Spice Trade Assoc. TL242
Amerio Contact Plate Freezers, Inc. T234
Ames Iron Works TR237
Anderson Co., V. D., The 144
Angelus Sanitary Can Machine Co. 232
Aseptic Thermo Indicator Co. BL155
Atlas Mineral Products Co. 202
Atlas Powder Co. 103

Baldwin-Lima-Hamilton Corp., Hamilton Division 100
Ball Brothers Co. 94
Barnes Co., W. F. & John 130-131
Beckman Instruments, Inc. 195
Bliss Co., E. W. 158
Buffalo Forge Co. 110

Cambridge Wire Cloth Co., The 186
Can-Do, Inc. 122
Canning Machinery Div., Food Machinery & Chem. Corp. 8
Carpenter Steel Co., The, Alloy Tube Div. 102
Century Electric Co. 221
Chain Belt Co. 90
Cherry-Burrell Corp. 235
Chevrolet Motors Div., General Motors Corp. 138
Chisholm-Moore Hoist Division, Columbus-McKinnon Chain Corp. 181
Chrysler Corp., Dodge Trucks 92
Clark Equipment Co. 194
Cleaver-Brooks Co., Boiler Div. 219
Cochrane Corporation 156
Colson Corp., The 150
Continental Can Co. 76
Corning Glass Works 79
Crane Co. 91
Crucible Steel Co. of America 127
Cyclone Fence Dept., U. S. Steel Corp. TR231

Darling Valve & Mfg. Co. 190
Day Co., The 199
Day Co., Inc., J. H., The 213
Dempster Brothers, Inc. 201
Dings Magnetic Separator Co. 25
Distillation Products Industries, Eastman Kodak Co. 249
Dodge Mfg. Corp. 132
Dodge & Olcott, Inc. 149
Dow Corning Corp. 180
Drehmann Paving & Flooring Co. 191

Economic Machinery Co. R154
Electric Auto-Lite Co., The TL228

Findley Co., F. G., The R152
Firmenich Inc. 222
Fischer & Porter Co. 113
Florasynth Laboratories, Inc. TL238
Food Machinery & Chem. Corp., Canning Machinery Div. 8
Foxboro Co., The 72
Frick Co. BR231
Fritzsche Bros., Inc. 115
Fuller Brush Co. 168

Gas Atmospheres, Inc. 99
Gaylord Container Corp. ..... Third Cover
Gemar Associates LC242
General Amer. Trans. Corp., Tank Car. 6
General Electric Co. 106-107, 142-143
General Mills, Inc. 233
Geveke & Co., Inc. 18
Girdler Company, The 125-126
Globe Woven Belting Co., Inc. 204
Glycerine Producers' Association 183
Goodrich Co., B. F., The 105
Gottscho, Inc., Adolph BL230
Gould-National Batteries, Inc. 118
Great American Industries, Inc., Rubatex Division 166
Great Lakes Carbon Corp., Dicalite Division 250
Griffith Laboratories, Inc., The 140

Hapman Conveyors, Inc. L236
Heil Co., The 203
Hinde & Dauch 187
Hoffman-La Roche, Inc. 192
Hudson Sharp Machine Co. 207
Huron Milling Co., The BL234, TR236, BR237, BL240, TR241, BR241
Hyster Company 174

Ingredients for the Food Processor 243
International Salt Co., Inc. 145

Jamison Cold Storage Door Co. 14
Jeffrey Mfg. Co., The TL240
Jenkins Bros. 123
Johns-Manville Corp., Celite Filter & Pressing Aids 108

Keasbey & Mattison Co. 136
Klenzade Products, Inc. L217

Langsenkamp Co., F. H. BR236
La Porte Mat & Mfg. Co. TR229
Link-Belt Co. 17, 23
Louis Allis Co., The 159-160

Magnus, Mabee & Reynard, Ins. 134
Malayan Tin Bureau, The 124
Manning, Maxwell & Moore, Inc. 16
Master Electric Co., The 135
McGraw-Hill Book Co., Inc. 218
Minneapolis-Honeywell Reg. Co., Industrial Div. 95-97
Monarch Mfg. Works, Inc. R217
Morton Salt Co. 101
Multi-Clean Products, Inc. 189

Nash Engineering Co. 216
National Can Corp. 111
National Starch Products 137
Neptune Meter Co. 129
Niagara Blower Co. 215
Nicholson Co., W. H. TR225
Nitrogen Division, Allied Chemical & Dye Corp. L154
Norda Essential Oil & Chem. Co., Inc. 22
Nutritional Research Associates 243

Oakite Products, Inc. 212
Oilgear Co., The 170

Package Machinery Co. 66
Paisley Products Inc. 10
Palmer Thermometers, Inc. 206
Pfaudler Co., The 119
Pfizer & Co., Inc., Chas. 19
Philadelphia Gear Works, Inc. 128
Powell Valves 104
Powers Regulator Co., The 109
Pure Oil Co., The 21

Quaker City Cold Storage Co., Inc. 243

Read Standard Corp. 112
Reeves Pulley Co. 148
Refined Syrups & Sugars, Inc. 80
Republic Rubber Division, Lee Rubber & Tire Corp. 64
Richardson Scale Co. 20
Riegel Paper Corp. 185
Rietz Manufacturing Co. 214
Ryerson & Son, Inc., J. T. 26

Sandvik Steel, Inc. 95
Sarco Co., Inc. 121
Scandia Mfg. Co. 164
Schoettle Co., Edwin J. 69
Schutte & Koerting Co. 139
Seaplant Chemical Corp. L152
Sellers Injector Corp BR155
Servel, Inc. 141
Shepard Niles Crane & Hoist Corp. 211
Shulton, Inc. 93
Sparks & Co., A. J. 153
Spraying Systems Co. BR234
Staley Mfg. Co., A. E. 70
Standard Oil Co. (Indiana) 205
Standard Steel Corp. 179
Stange Co., Wm. J. 83
Sterwin Chemicals Inc., Vitamin Division ..... Second Cover
Stokes & Smith Co. 98
Stone Container Corp. 84
Strahman Valves, Inc. BL238
Sturtevant Mill Co. 208

Taylor Instrument Cos. 116-117
Thermoid Co. 133
Timken Roller Bearing Co., The 151
Ton-Tex Corp. BR225
Transparent Wrap Machine Corp. 188
Triangle Package Machinery Co. 182
Tri-Clover Machine Co. 147

Union Bag & Paper Corp. 15
United States Steel Products Div., United States Steel Corp. 157
United States Steel Corp. Cyclone Fence Dept. TR231
U. S. Steel Products Div. 157
U. S. Stoneware 114

Van Ameringen-Haebler, Inc. 12
Victor Balata & Textile Belting Co. BL226
Viking Pump Co. BL228
Vilter Mfg. Co., The 197
Visking Corp., The 197

Wallace & Tiernan Co., Inc. 200
Walworth Co. 176
West Disinfecting Co. 24
Western Precipitation Corp. ..... Fourth Cover
Westinghouse Electric Corp., Sturtevant Division 85
Where To Store Frozen Foods 243
Worthington Corp., Air Conditioning & Refrig. Div. 120
Wyandotte Chemicals Corp. 146

Yarnall-Waring Co. TL226, TL230

SALES REPRESENTATIVES

ATLANTA 3 ..... Robert H. Sidur
1321 Rhodes-Haverty Bldg., Walnut 5778

BOSTON 16 ..... P. T. Fegley
350 Park Square Bldg. ... Hubbard 2-7160

CHICAGO 11 ..... J. G. Cashin
520 N. Michigan Ave. ... Mohawk 4-5800

CLEVELAND 15 ..... Thomas E. Taylor
1510 Hanna Bldg. ... Superior 1-7000

DETROIT 26 ..... Thomas E. Taylor
856 Penobscot Bldg. ... Woodward 2-1793

DALLAS 1 ..... J. H. Cash
First National Bank Bldg. Prospect 7-5064

LOS ANGELES 17 ..... Gordon Jones
1111 Wilshire Blvd. ... Madison 6-4323

NEW YORK 36 ..... P. T. Fegley
330 West 42nd St. ... C. C. Randolph
Longacre 4-3000

PHILADELPHIA 3 ..... Edward A. Martin
17th & Sansom Sts. ... Rittenhouse 6-0670

PITTSBURGH 22 ..... Edward A. Martin
7389 Oliver Bldg. ... Atlantic 1-4707

SAN FRANCISCO 4 ..... R. E. Dorland, Jr.
68 Post St. ... Douglass 22-4600

ST. LOUIS 8 ..... J. G. Cashin
Continental Bldg. ... Lucas 4867

LONDON, ENGLAND ..... W. J. Tydeman
95 Farrington Street, E. C. 4

PROFESSIONAL SERVICES 243

SEARCHLIGHT SECTION
(Classified Advertising)
H. E. Hilty, Mgr.

EMPLOYMENT
Positions Vacant 244
Selling Opportunities Offered 244
Positions Wanted 244
Selling Opportunities Wanted 244
Employment Services 244

BUSINESS OPPORTUNITIES
Offered 244

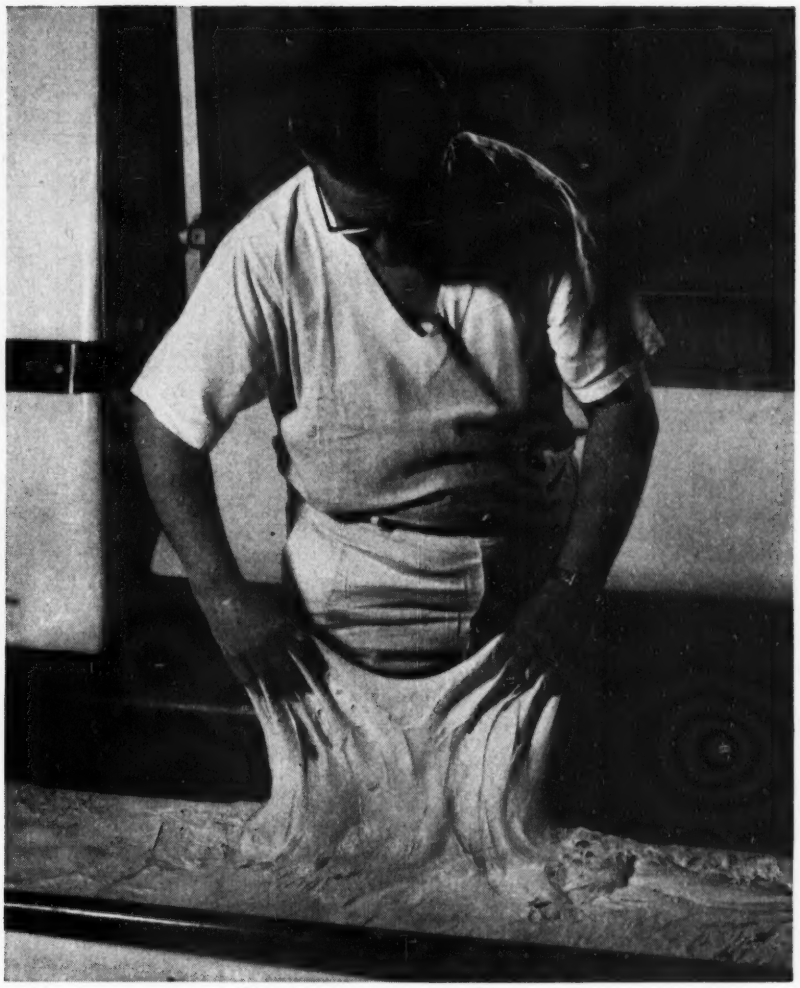
PROPERTY
Wanted 244

EQUIPMENT
(Used or Surplus New)
For Sale 245-247

WANTED
Equipment 246
Miscellaneous 244

ADVERTISERS INDEX

Aaron Equipment Co. 247
Allied Equipment Co. 245
Brill Equipment Co. 247
Consolidated Products Co., Inc. 247
Employment Counsel Inc. 244
Equipment Clearing House Inc. 246
First Machinery Corp. 246
Food Machinery & Chemical Corp. 244
Gale, J. C. 244
Gelb & Sons Inc., R. 245
Harris Machinery Co. 246
Kehoe Machinery Corp., Lester 245
Loeb Equipment Supply Co. 245
Machinery & Equipment Corp. 246
Merchant's Cold Storage & Warehouse Co. 246
Perry Equipment Corp. 247
Phillips Canning Co., Dr. P. 247
Pillsbury Mills Inc. 244
Savage Bros. Co. 247
Stevenson, Jordan & Harrison Inc. 244
Stone Supply Co., J. P. 245
Union Standard Equipment Co. 245
Wyler & Company 246



What's **different** about this dough?

distillers of monoglycerides made from natural fats and oils

DPi

Also... vitamins A and E

It's firm, almost silky in texture. It leaves the mixing machine fast and clean. It has uniform elasticity and a smoother skin for molding.

The finished loaf will have better color and flavor because less sugar is consumed during proofing. It will have an even oven spring during the bake. It will come out of the oven with a fine, uniform texture. It will have a tender crumb structure.

You need make no changes in shop practice to get dough like this—no increase in mixing time. You do it simply by adding a small amount of Myvatex Food Emulsifier as part of the shortening. Myvatex Food Emulsifier is a bland fat that does not affect the desired flavor and aroma of your finished bread and rolls.

It is a 50/50 mixture of prime steam lard homogenized with Myverol Distilled Monoglyceride, which itself is a nutritious food derived from natural fats via DPi's own unique method of molecular distillation.

A test of Myvatex Food Emulsifier in your own shop, under your own operating conditions, will show you how easy it is to use and how it improves the look, feel, and taste of bread and rolls.

Let us know how much you need for a fair test. Write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies and Company, Los Angeles and San Francisco • Charles Albert Smith Limited, Montreal and Toronto.

"Myvatex" and "Myverol" are trade-marks.

Distillation Products Industries *is a division of* **Eastman Kodak Company**

For more information, use coupon on page 209.

Mister, you're surrounded by things containing diatomite, or which were filtered by it. That beer you're delivering owes its brilliance and clarity to diatomite filtration. The paint on your truck has likely been extended with diatomite. Your battery may have diatomite as a filler in the case or separators. And diatomite helped in several ways to produce the oil which lubricates your truck motor.

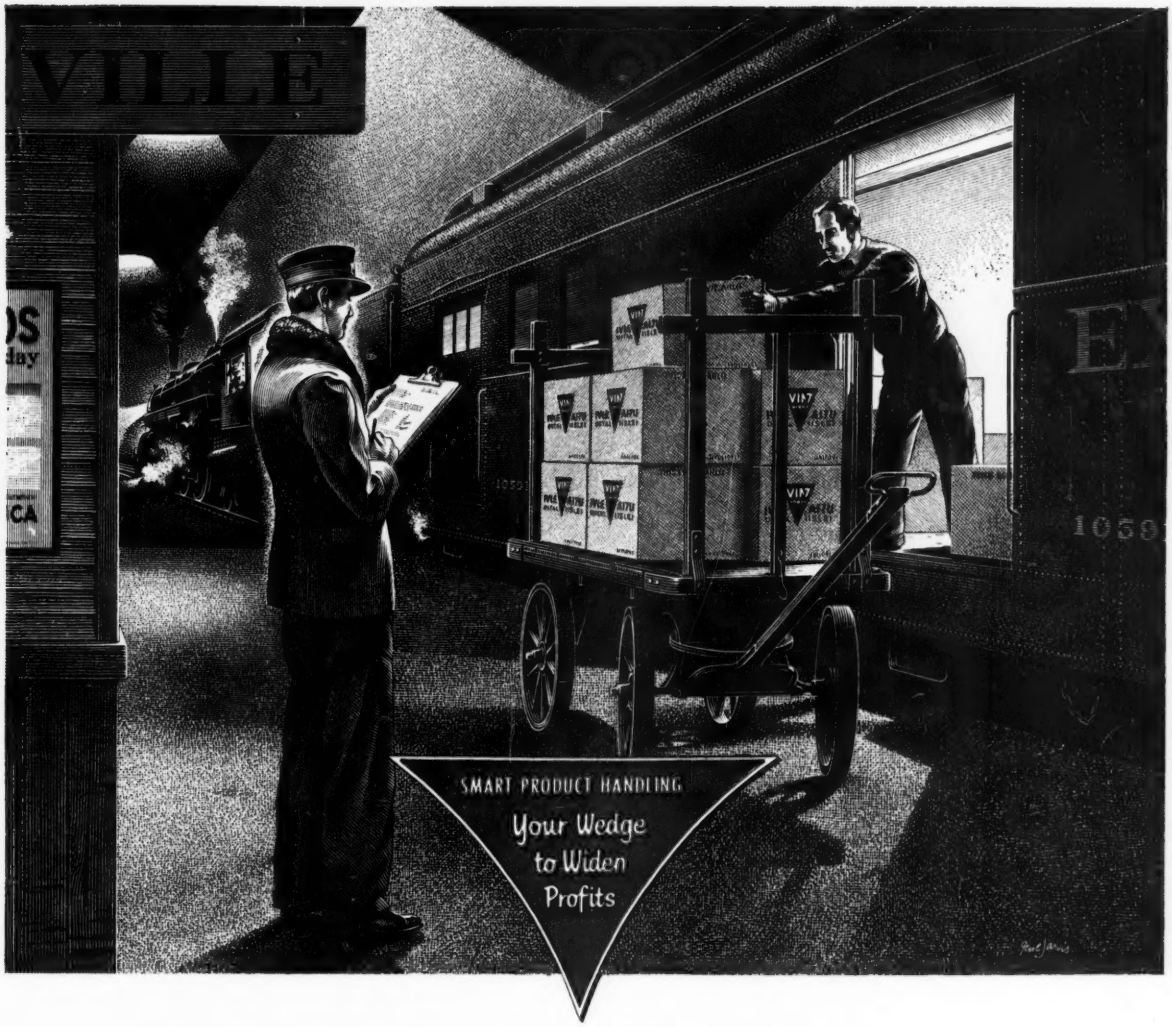
In any of these cases, mister, it's a better-than-even bet that the diatomite used bore the name DICALITE — because DICALITE is top-quality diatomite, processed for many uses to the highest quality standards ever established. Food processors use DICALITE filteraids to produce sugar, shortening, salad oils, jellies and other good things on the shelves of that market. DICALITE plays a vital role in producing streptomycin and other antibiotics, vitamins and other pharmaceuticals. The dry-cleaner uses DICALITE products to keep his cleaning solvent clear and active . . . there's DICALITE in the magazine pages on the news stand and in those beer cartons — and perhaps even in the asphalt under your feet and in the concrete of the building.

So varied are the uses of this versatile material, nobody yet knows them all. If you'd like to learn more, let us send you a bulletin on DICALITE filteraids, fillers, insulation, or other aids to industry.

Write to Dicalite Division, Great Lakes Carbon Corporation, 614 So. Flower St., Los Angeles 17, California

Dependable GREAT LAKES *Dicalite*® DIATOMACEOUS MATERIALS

NEW YORK 17 • CHICAGO 1 • LOS ANGELES 17



The Damage Prevented By Gaylord Boxes Is Clear Profit For You

When you comb your operations for places to cut costs, take a long look at damage claims. The actual claim is only the beginning—it sets off a chain reaction of confusion that cuts into what should have been your profit.

Many manufacturers are discovering the profit advantages of reducing damage claims through the extra protection of Gaylord boxes.

The Gaylord quality that assures you this added protection comes from new developments in tougher fibre board, stronger designs and precision accuracy in manufacture... all built into every Gaylord box to protect your profit, as well as your product.

For information and cooperation, phone your nearby Gaylord office.

GAYLORD CONTAINER CORPORATION

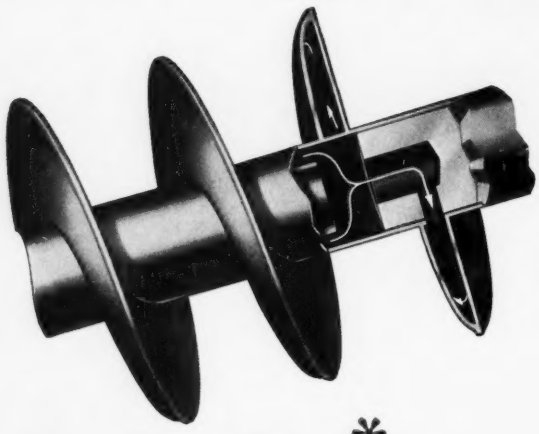
Gaylord Boxes

General Offices: SAINT LOUIS, MO.

SALES OFFICES COAST-TO-COAST

CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS • KRAFT BAGS AND SACKS • KRAFT PAPER AND SPECIALTIES

A great new advancement in heat exchangers...

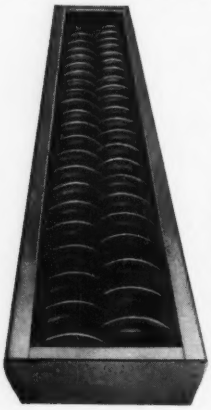


THE holo-flite* PROCESSOR
(HOLLOW-FLITE)

A simpler, more compact way to cool slurries, solids or pastes—in continuous flow!

Do you have processes where slurries, solids, pulps or pastes must be cooled or cooked? Do you know you can now handle such processes—*in continuous flow*—in as little as 1/5th the space required by other types of heat exchangers—and with many other important advantages?

The newly-developed HOLO-FLITE Processor is the answer!



what IT IS!

Basically the HOLO-FLITE consists of two or more flights of hollow-bladed screw conveyors. The product to be processed moves in a trough around the conveyor screws. The heat-transfer fluid circulates through the hollow blades and shafts of the conveyor. The product is constantly rotated into, around, under and over the blades and shafts through which the heat-transfer fluid is circulating, assuring quick, uniform heat passage between the two mediums—*as the product is continuously moved along in a bulk-flow without interruptions!*

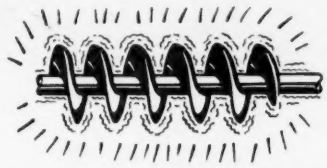
Get the complete story on HOLO-FLITE *savings and how this new advancement can simplify your processing operations. It is backed by the same organization that pioneered* COTTRELL *Precipitators and* MULTICLONE *Collectors—your assurance of complete dependability.*

DETAILED INFORMATION!
New 8 page bulletin describing HOLO-FLITE features and applications will gladly be sent on request. Write, wire or phone for your free copy!

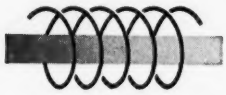
* Reg. T. M.

why IT'S BETTER!

The HOLO-FLITE principle provides many important advantages in modern processing operations...



ITS LARGE HEAT-TRANSFER SURFACE requires far less space—as little as 1/5th the space required by other heat-exchange equipment. Further, flights can be "stacked" as high as desired to save floor space, simplify installation!



ITS SLOW ROTATION IS SO GENTLE that granular and powdered solids are handled with no dusting—little or no particle abrasion. Result—no dust recovery problems . . . simple, inexpensive installation.

IT IS ADAPTABLE to a wide range of applications—handles solids, pulps, pastes and slurries with equal ease. Heat transfer agent can be refrigerant, water or other fluids to provide a wide range of temperatures. Cooled products can be packed directly from HOLO-FLITE discharge, saving time, space and additional handling.

IT CAN BE DESIGNED to handle virtually any capacity by varying the diameter and length of the flights, and the number of "tiers."

WESTERN Precipitation CORPORATION

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: **1016 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA**
CHRYSLER BLDG., NEW YORK 17 • 1 N. La SALLE ST. BLDG., CHICAGO 2
1429 PEACHTREE ST. N.E., ATLANTA 5 • HOBART BLDG., SAN FRANCISCO 4
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL